This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

ARCH LIBRARIES
06906098 0

V

VHCA ~~VHCA~~

Missouri ~~Missouri~~

Annual report 1901 - part 2

15TH ANNUAL REPORT

OF THE

STATE COAL MINE INSPECTOR

OF THE

STATE OF MISSOURI

FOR THE

YEAR 1901.

NEW YORK PUBLIC LIBRARY

JEFFERSON CITY, MO.:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS.
1902.

THE NEW YORK
PUBLIC LIBRARY
189495
ASTOR, LENOX AND
TILDEN FOUNDATIONS.
R 1910 L
1903

TABLE OF CONTENTS.

Page
Letter of transmittal 7
Introduction 9
Remarks on report 13
Table No. I—Summary 14
Table No. II—New mines 15
Table No. III—Improvements 17
Table No. IV—Classified improvements 20
Convention of operators and miners 21
Contract between operators and miners 23
Mine ventilation 39
Miners' oils 43
Comparative tests of the generation of steam by coal and oil 46
Scale testing 47
Strikes by counties 49
Mine legislation 53
Heating values and proximate analysis of Missouri coals 55
Table showing calorific value 57
Table of proximate annalysis 59
Accidents in coal mines 60
Fatal accidents by counties 64
Explosion at Mine No. 14 74
Non-fatal accidents 77
Table V showing accidents 82

Inspection by counties:

Adair—C. B. Havens Coal Co 85
    Robt. Besanko 88
    Thos. Scott 88
    F. J. Miller 88
    D. C. Scott 89
    Kirksville Coal and Consolidated Co 89
    Rombauer Coal Co 89
    Kansas City Midland Coal Co 92
    Manufacturers' Coal and Coke Co 94
    Ninevah Coal & M. Co 97
    American Fuel Co 97
    Spring Valley Coal Co 98

Audrain county:—

    Forber Coal Co 99
    Kreiger Coal Co 100
    Vandalia Coal Co 100
    Mississippi Glass Co 100
    Standard Coal Co 101
Barton county 101
    Western Coal & Mining Co 102
    Hall & Fletcher Coal Co 103
    Swigart & Sons 103
    Josiah Short 103
    Wear Coal Co 104

Page

Bates county 107
  Vernon Coal Co 108
  Rich Hill Coal & Mining Co 109
Boone county 111
  Blackfoot Coal Co 111
  Carter Bros. Coal Co 111
  Columbia Coal Co 112
  S. D. Gordon 112
Caldwell county 113
  Caldwell Coal Co 113
  Dripping Springs Coal Co 114
Callaway county 114
  Fulton Fire Brick & M. Co. 115
Carroll county 117
Cass county 118
Cedar county 118
Chariton county 119
Clay county 119
  Missouri City Coal Co 119
Dade County 120
Grundy County 120
Henry County 121
  Cooper Creek Coal Co 121
  John Thompson & Co 121
  Jordan Coal & Coke Co 122
  W. S. Dicky Clay Manufacturing and Mining Co 123
  Co-operative Coal Co 124
  D. P. Pigg & Co 124
  Tebo Coal Co 124
Howard County 125
Jackson County 126
  Brush Creek Coal Co 126
Johnson County 128
Lafayette County 128
  Diamond Coal Co 130
  Corder Coal Co 130
  Salt Fork Coal Co 131
  Bonanza Coal Co 132
  Farmers' Coal Co 132
  J. H. Looney Coal Co 133
  Higginsville Farmers' Coal Co 133
  Dover Coal Co 135
  O. M. Gaffin 135
  J. C. McGrew 136
  Star Coal Co 138
  Aull & Serrat 138
  Lexington Coal and Mining Co 139
  Mayview Coal Co 143
  Silver Creek Coal Co 144
  Buckhorn Mine 144
  Wellington Coal and Mining Co 144
  Labor Exchange Coal Mining Association 144
  Carter Mine 145
Linn county 146
  Brookfield Coal Co 146
  Marceline Coal Co 147
Livingston county 148
Macon county 149
  Kansas & Texas Coal Co., Ardmore 149
  Bevier Black Diamond 152

Page

- Northwestern Coal Co. 152
- Kansas & Texas Coal Co., Bevier 154
- Murlin Coal Co 158
- Watson Coal Co. 161
- Helmet Mining Co. 162

Montgomery county 165

Monroe county 165

Morgan county 165

Nodaway county 166

Pettis county 166

Putnam county 167
- Blackbird Coal Co. 167
- Mendota Coal Co. 168
- Standard 171

Randolph county 172
- Elliott Coal Co. 172
- Higbee Coal Co 176
- Interstate Coal Co 179
- Morris Bros. Coal Co 180
- Murlin Coal Co 183
- Enterprise Coal Co. 186
- Cooper & Stackhouse Coal Co 186

Ralls County 187
- Rall county Coal Co. 187
- Clark Coal Co 188
- Perry Coal Co 188
- Ralls county Mine No. 2 189

Ray County 189
- Murlin Coal Co 190
- Pickering Coal Co. 194
- Mercantile Coal Co. 194
- Wilson Coal Co 196
- Pence & Calnen Coal Co 197
- Camdem & Richmond Coal Co 198

St. Clair County 201

Vernon County 201
- Arthur Coal Co 202
- Rich Hill Coal Co. 202
- Central Coal and Coke Co. 203

Coal Pockets 205

Table Showing Annual Product 206

Table No. 6—Summary 210

Table No. 7—Showing by Counties Mines, Plants etc 212

Table No. 9—Showing rank of Coal producing Counties 232

Postoffice address of mine operators 236

LETTER OF TRANSMITTAL.

City of Jefferson, Mo., April 15th, 1902.

HON. A. M. DOCKERY, Governor of Missouri:

Sir—In obedience to the requirement of law, I have the honor to submit the Fifteenth annual report of the Inspector of Coal Mines.

Very respectfully,
CHARLES EVANS,
Inspector of Coal Mines.

INTRODUCTORY.

Notwithstanding the increased number of mines, employes, coal production and correspondence, the work in the field and office has been faithfully looked after and taken care of, and the Inspector has the satisfaction of presenting the Fifteenth Annual Report, not only within the limit of time prescribed by law, but with a far more satisfactory showing of the results from our coal mines than that of any preceding year. No period in the mining history of the State will begin to compare with the year 1901, in its growth and progress as may be evidenced in the number of new mines opened, the increased capacity and unexcelled equipment of the older mines.

The object sought in this report is to furnish such information relative to coal mine conditions, progress and improvement and offer such suggestions as may prove beneficial to operator, miner, and all those interested in mining and the further development of the industry and our splendid mining territory. The coal mine inspector has made over 600 inspections, unaided, the prime object of his inspections having been to maintain that condition of safety, sanitation and that volume of pure fresh air in our mines that would in all respects meet the requirements of the law relative thereto. The safety of the miner, to provide for him healthy surroundings and to make sure of a means of safe exit from the mine in the event of accident to either the hoisting or escape shafts, has been the especial aim and concern of the inspector; a confirmation of such efforts can easily be established by a reference to the inspector's notes concerning the numerous inspections and the table showing improvements made.

The large output of our mines is due as much to the increased capacity provided and the further development of mines already in existence, as can be attributed to the new mines opened. The condition of our mines generally, viewed from every desirable underground feature, is better than we have every known them to be in. Every modern and up-to-date appliance affording a greater degree of safety to the miner and that tends to facilitate the rapid and economical handling of the product, has been promptly availed of by our operators. In fact this last year developed more voluntary betterments on the part of our operators in all matters pertaining to the health, safety and comfort of our miners than ever before witnessed; this in connection with the prompt compliance with the instructions given operators, has proven not only a great help to the inspector, but points to a most gratifying indication of that interest, which, in the end, must result in great benefit to both miners and mines.

Our miners—thanks to the prudent and conservative men at the head of their organizations—have done admirably, harmony and less friction has been more noticeable than for years, with the result that work has been more steady.

To Mr. George Richards, President of the U. M. W. A. of A., and Mr. Geo. Manuel, Secretary, as well as to very many excellent miners, we wish to return our most sincere thanks for valuable information furnished during the year, concerning the conditions prevailing in the mines. The information coming from such sources has greatly assisted the inspector, as it has enabled him to give direct attention to the mines most in need of attention, while a simple letter has answered every purpose in many other case. In this connection, attention is called to the fact. too generally overlooked, that there is but one inspector to look after this entire State and that it often happens that there are as many as six calls in one day to as many different sections of the State. all cannot be attended to the same day, so that we give preference to the larger mines where the most men are affected. The inspector may be relied on to give attention to each and every call made just as the opportunity is furnished him by the situation or condition of affairs; but it is impossible for him to visit a number of places in different parts of the State on the same day, besides his duties are not confined to the inspection of mines only but to the inspection of scales, oils and the investigation of all accidents.

It is not only our great pleasure, but we feel it our duty to again most highly commend Mr. J. W. Marsteller, Secretary of the Bureau of Mines and Assistant Inspector, for the excellent service which he has rendered, in the preparation of the maps and statistical matter found in this report. His intimate association and connection with the work of the Bureau for the past 12 years, has made him so familiar with the duties of the office as to render the service which he performs for the State and the inspector almost invaluable. He at all times displays a deep interest in all matters connected with the mining industry, is exceedingly accurate in all of his work and his suggestions have proven most helpful in many instances. He possesses my full confidence to act as my second self in all things, and in no single instance or act of his, has he shown that my confidence in him has been misplaced. The inspector having so large a territory to cover, it devolves upon his assistant to attend to most of the correspondence, to issue all notices to coal, lead and zinc operators, to keep a record of and examine all mine maps, boiler inspections, mine accidents and when his limited time permits, assists the inspectors in the inspection of mines.

REPORT.

This report covering the calendar year 1901, shows the largest coal production we have ever made in any one year, also a greater number of men employed, more new mines opened, more improvements and a more satisfactory state of affairs in and connected with our mines than heretofore recorded.

The output of coal for the year was 3,813,527 tons, as against 2,995,022 tons for the year 1900, showing an increase of 818,505 tons. This product sold at the mines for $4,716,331, against $3,643,975 for 1900, an increase of $1,072,356, or 29 per cent. The average price received at the mines per ton of coal was $1.24, or three cents in excess of the previous year. The number of men employed in and about the mines during the winter season was 10,666, as against 8,698 the year before, an increase of 1,968 men. The actual number of miners in winter at work in the mines was 8,354 and during the summer 5,968. The average number of all men employed in and about the mines during the year was 9,226. There were 422 mules worked in the mines during the winter and 341 in the summer. The mines are entered by 165 shaft openings, 61 slopes, 88 drifts and 54 strip-pits or open cuts. Ventilation was furnished by the use of 73 fans, 124 furnaces and 150 by natural ventilation. The power was furnished by 6 electric plants, 102 steam plants, 146 horse power plants and 106 hand plants. The method or plan of working underground was by the long wall system in 171 mines and by the pillar and room plan in 164 mines. There were 100,622 kegs of powder consumed in the mines which cost the miners $199,684.80.

There were 31 accidents in the mines during the year or two less than the former year with more men employed and a largely increased tonnage; of this number 15 were fatal and 16 non-fatal. Falls of roof and coal caused 48 per cent. of the accidents; powder explosions 16 per cent., mine cars 16 per cent., premature explosions 7 per cent., returning too soon on shot 6 per cent. and windy shots 7 per cent. One life lost for each 254,235 tons of coal mined and one non-fatal accident for each 238,345 tons mined.

TABLE I.—SUMMARY AND COMPARISON.

Comparison of the years 1900 and 1901.	1900.	1901.	Increase.	Decrease.
No. of coal producing counties	36	36		
No. of mines and strip-pits operated	350	368	18	
No. of mines employing over ten men	138	148	10	
No. of fans in use during the year	61	73	12	
No. of tons of coal mined during the year	2,995,022	3,813,527	818,505	
Total receipts from sale of product	$3,643,975	$4,716,331	$1,072,356	
Average price received at mines per ton of coal	1 21	1 24	.03	
No. of men employed in winter	8,698	10,666	1,968	
No. of men employed in summer	6,601	7,786	1,185	
No. of miners employed in winter	7,055	8,354	1,299	
No. of miners employed in summer	5,300	5,968	668	
No. of other employes in winter	1,643	2,312	669	
No. of other employes in summer	1,298	1,818	520	
No. of kegs of powder consumed	69,460	100,622	30,162	
Total cost of powder to miners	$138,538	$199,684	$61,146	
No. of men fatally injured	10	15	5	
No. of men non-fatally injured	23	16		7
No. of wives made widows	4	8	4	
No. of children made fatherless	7	14	7	
No. tons coal mined for each life lost	299,502	254,235		45,267
No. tons coal mined for each non-fatal accident	130,218	238,345	108,127	
No. of new mines opened	12	18	6	
No. of old mines abandoned	4	11	7	

TABLE II.

Showing new mines opened and old mines abandoned during the year ending December 31, 1901.

County.	New mines opened.	Old mines abandoned.
Adair............	By C. B. Havens & Co. Mine No. 2.......	
"	Kansas City Midland Coal Co. Mines Nos. 1 and 2..........................	
"	Rombauer Coal Co. No. 2...............	
"	Kirksville Coal Co.....................	
"	Manufactures Coal & Coke Co. Nos. 1 and 2..................................	
"	Nineveh Coal Co........................	
Barton...........	Wear Coal Co. No. 10.....................	
Bates.............	....	By Rich Hill Coal Co. Nos. 18, 20 and 21.
Henry	By Tebo Coal Co............................	Tebo Coal Co.
Lafayette	Lexington Coal Co.........................	Lexington Coal Co.
"	Valley, Midway & Summit Mines......	Riverton No. 1, McDowell mines.
Macon	Murlin Coal Co. No. 10..................	
"	....	Northwestern Coal Co. No. 4.
"	Watson Coal Co. No 3..................	
"	Kansas & Texas Coal Co. Nos. 52-62-70	Kansas & Texas Coal Co. Nos. 48-56-68.
Putnam..........	Blackbird Coal Coal Co. No. 2.........	
"	....	Fielding & Son.
"	By Mendota Coal Co. Nos 9 and 10........	
Ralls.............	Ralls County Coal Co.....................	
"	Perry Coal Co...............................	
Randolph.........	Morris Bros. Coal Co......................	
"	Murlin Coal Co. No. 11....................	Murlin Coal Co. No. 7.
"	Elliott Coal Co. No. 6........	
"	Higbee Coal Co. No. 2.....................	
Ray	Fowler & Mackin Coal Co................	
"	Mercantile Coal Co. No. 17.............	
"	Richmond & Camden Coal Co No. 14..	Richmond & Camden Coal Co. No. 3.
Vernon	Central Coal & Coke Co. No. 17........	
"	Rush Coal Co	

DEVELOPMENT AND IMPROVEMENTS.

No other year will begin to compare with the year 1901, in its extraordinary record of improvements and additions in the mines and mining plants. Not only will there be observed a greater number of new mines opened up and developed, but that a larger number of old mines have been remodeled, newly equipped with the most modern machinery and their capacities increased to an extent never before experienced in any one year. In fact such has been the nature of the improvements made, that our mines will compare most favorably with the mines of any mining State.

The inspector has made faithful effort to keep such record as would enable him to chronicle every detail associated with all improvements made during the year and invites the attention of all those interested in the progress and that high standard of equipment made necessary to keep pace with the times. The inspector highly appreciates the efforts made by our operators, to have their mines measure up to that standard of excellence in which they are found today; it is also a great pleasure to him to call to mind many improvements added which were the result of his own suggestions and he earnestly hopes that every one of them will be richly repaid for every dollar so expended and that their business may so improve, expand and enlarge, that not only they but the community at large may be greatly benefited.

Table No. 3 following will be found to contain a list of the improvements made:

Improvements made.

County.	Coal company.	Improvements.
Adair	American Fuel Co.	Sinking air-shaft, rebuilding furnace.
Adair	C. B. Havens & Co.	Sinking escapement shaft at mine No. 1 and building stairway. New machinery at mine No. 2, engine and boiler house, two new boilers, blacksmith shop, new pit-head, one mile of railroad track, 50 new pit-cars, new fan constructed and about 50 houses and supply store built.
Adair	Kansas City Midland Coal Co.	Opened two new mines, setting two sets of double engines at mines Nos. 1 and 2, set four boilers, two fans, constructed two miles of railroad, 100 pit-cars and 80 houses and supply store built.
Adair	F. I. Miller	Opened new slope and sunk shaft.
Adair	Rombauer Coal Co	Opened one new mine and equipped same with complete set of machinery, new engine and boiler houses, new blacksmith and machine shop, new fan cages and ropes, two miles of railroad track constructed, 40 houses and 50 new pit-cars built.
Adair	Manufacturer Coal and Coke Co.	Two new mines opened, two sets of engines set and boilers built, tipples, trestle, platforms and head house constructed, blacksmith and machine shop built, four miles of railroad constructed, 75 houses and a supply store and 60 pit-cars constructed.
Audrain	Bevan & Co.	Sunk shaft and rigged it with horse power.
Audrain	Standard Coal Co	Building head house, platform, six chutes, blacksmith shop and a pump house.
Barton	C. F. Swigart	Sinking air-shaft.
Barton	Jos. Travis	Sinking air-shaft.
Barton	Wear Coal Co	Mine No. 10 opened with new and complete equipment, consisting of new machinery, boilers, engine and boiler rooms, new pit-head, ropes and cages, blacksmith and machine shops built, a fan set, one mile of railroad constructed, 100 pit-cars built, and 45 residences and a supply store built.
Bates	D. McCombs	Opened one slope mine.
Bates	Robt. Pearson	One new steam boiler and a steam pump; fan set in place of furnace.
Bates	J. W. Steele	One steel hoisting rope and six new pit-boxes.
Bates	Vernon Coal Co.	Sunk new air-shaft and removed fan.
Bates	Rich Hill Coal Co	Two new air shafts sunk at mine No. 15, a new electric motor to do the haulage, and two new hoisting ropes.
Boone	I. H. Keene	Two new cages.
Boone	William R. Praythor	New platform erected; head house and blacksmith shop built.
Callaway	Sims Bros. Coal Co	One new steam boiler set and fan erected.
Grundy	Grundy County Coal Co	New steam pump.
Henry	L. M. Beaman	One new pump and pump-house.
Henry	Cooper Creek Coal Co	Sinking new air-shaft.
Henry	Co-operative Coal Co	Re-curbing air-shaft, and 25 pit-cars built.
Henry	H. T. Demaree	Air-shaft sunk and tipple built.
Henry	C. W. Field	Air-shaft sunk.
Henry	John Hurst	New air-shaft.
Henry	Wm. Rusk	One new rope and a pair of scales.
Jackson	Brush Creek Coal Co	Sunk shaft 150 feet, put in two new ropes, two new cages, two sets of safety catches, and built 50 new pit-cars.
Lafayette	Bonanza Coal Co	Two new cages put in; all entries brushed.

M—2

TABLE III.—Continued.

County.	Coal company.	Improvements.
Lafayette	Consolidated Coal Co.	Opened one mine, No. 8; replaced the horse-power rigging at mine No 6 by steam power; new fan put in.
Lafayette	Carter Coal Co.	New tipple and platform built; old track re-laid with heavy iron, and 100 pit-cars built.
Lafayette	Corder Coal Co.	Escapement shaft sunk and ladder erected; two new ropes put in; cages remodeled and safety catches put on.
Lafayette	Dover Coal Co.	Re-laid old wheel road with new and heavy iron; blasted 600 feet of rock down on entries.
Lafayette	J. A. Edwards	Opened new mine and equipped it with horse-power apparatus.
Lafayette	Beatty Farmers Coal Company	Equipped mine with an electric plant consisting of a generator 250 volts, 100 K. W., furnising power to run five long-wall machines.
Lafayette	Beatty Farmers Coal Company	Making cut 3⅛ feet deep; shaft enlarged; machinery placed for hoisting in place of horse; 75 pit-cars built.
Lafayette	O. M. Laffin	One steam boiler and pump; wheel road re-laid with heavy iron; 40 new pit-cars built.
Lafayette	James Hudson	Opened a mine and equipped it with horse-power rigging.
Lafayette	E. Y. Hoffman	New mine and equipment.
Lafayette	Black Diamond	Air-shaft sunk.
Lafayette	Labor Exchange Association, Branch No. 305	Weigh offices built, and another coal and dump tipple built.
Lafayette	Lexington Coal Co.	One air-shaft sunk at Glen Oak mine and fan set; 25 pit cars built; four long-wall machines put in at the Valley mine, which are operated from a central station at Midway mine; 100 pit-cars built; eletric plant installed at Midway mine and mining machines introdeced; all epuipment new; three miles of railroad constructed; 100 pit-cars made and 150 houses built and removed.
Lafayette	J. C. McGrew	Electric plant installed in mine, consisting of six link belt long-wall machines, two electric haulage motors and provided with 150 K. W. generator driven by a 250-horse-power engine; all old iron in mine removed and relaid with new 16-pound steel rail; 50 new pit-cars built.
Lafayette	Thos. Walton	Entry given height by taking down rock.
Lafayette	Independence Coal Co.	Nine houses built for miners; rock shot down on entries.
Linn	Marceline Coal Co.	Two new ropes and two new cages put in; fan repaired.
Linn	Bernard Schaefer	Two new cages put in.
Macon	Helmer Coal Co.	Escapement shaft sunk and ladder erected.
Macon	James & Son	One new steam pump.
Macon	Kansas & Texas Coal Co.	An electric plant installed at mine No. 61, consisting of a cut-off engine with a 100 K. W. generator and five electric mining machines; one new boiler set and 86 new houses built; self-dumping cages, automatic screen and Phillips box-car loader at mine No. 66, and 800 yards of railroad built.
Macon	Murlin Coal Co.	Mine No. 10 sunk and equipped; engine and boiler room built, one mile of railroad constructed, blacksmith and machine shops built, 10 houses built for miners and 75 new pit-cars made.
Macon	Northwestern Coal Co.	Pump shaft sunk at face of workings at old mine No. 1 and equipped with pumps and pipes connecting with mine No. 7; Phillips box-car loader erected at mine No. 8.
Macon	Watson Coal Co.	Mine No. 3 sunk and equipped; engine and boiler room, blacksmith shop, fan house and pit-head erected; 1¼ miles of railroad built and 25 pit-cars made.
Ralls	Clark Coal Co.	Opened mine and equipped it with horse-power apparatus.
Ralls	Perry Coal Co.	Opened new mine and erected horse-power rigging.
Ralls	Ralls County Coal Co.	Sunk shaft and opened mine No. 2 and equipped same with horse-power rigging.
Putnam	Arnold Bros.	Opened mine and iron track laid.
Putnam	Blackbird Block Coal Co.	Rebuilt plant at mine No. 1 which was destroyed by fire; opened mine No. 2, engine set, head-house, tipple and platform erected; 25 pit-cars built and one-fourth of a mile of railroad constructed.

Putnam	H. Medlin Coal Co.	Opened and equipped new mine.
Putnam	Rogers Bros. Coal Co.	Air-shaft sunk and furnace built.
Randolph	Cooper & Stackhouse Coal Co.	Air-shaft sunk, new catches set on cages and cages repaired.
Randolph	Elliott Coal Co.	Two new hoisting ropes and springs set on safety catches at mine No. 3; mine No. 6 opened and shaft sunk and fully equipped with machinery and boilers; new engine and boiler rooms, pit-head, tipple and head-house; 50 pit-cars built and one mile of railroad constructed.
Randolph	Higbee Coal Co	Escapement shaft sunk at mine No. 1 and stairway built; mine No. 2 opened up and shaft sunk, equipped and developed; engine and boiler rooms built; pit-head, tipple and screens constructed; blacksmith shop built and a fan set.
Randolph	J. J. Lewis	Opened a new slope.
Randolph	Morris Bros. Coal Co	Opened mine and equipped it with modern machinery; new pit-head and tipple-house, engine and boiler rooms built, a fan set, 75 pit-cars made and one mile of railroad track laid in switches.
Randolph	Murlin Coal Co.	Opened out mine No. 11 and equipped same with a pair of engines. Engine and boiler room built, landing platform 75 feet long constructed and chute screens and a hopper scale set; 1200 feet of trestle built and 50 new pit cars made.
Ray	Camden & Richmond Coal Co	Re-curbed shaft at mine No. 5, remodeled and new foundation under pit-heads.
	Fowler Coal Co	Opened new mine and rigged it up with horse-power apparatus; 50 pit-cars made and about three-fourths of a mile of railroad built.
	Grimes Mine	One new hoisting rope.
	Hubbell Coal Co.	Two new cages put in, recovered gin ring and 15 new pit-cars made.
	Jas. Loeven	Opened a new drift.
	Mercantile Coal Co	Sunk shaft, developed and equipped mine No. 17; engine and boiler house built and pit-head erected. Escape shaft sunk and fan set; 50 new pit-cars made and one mile of railroad constructed.
	Murlin Coal Co.	Installation of electric plant equipment complete at mine No. 80, consisting of one new Rohan boiler, Morgan & Gardner generator, a 10-ton electric motor to do the haulage, six new Morgan & Gardner long wall machines, two new cages and two new hoisting ropes, safety catches remodeled and replaced, engine house built, ladder built in escape shaft, one new steam pump, old wheel road taken out and relaid with 16-pound steel rail, and fifty new self oiling pit-cars made.
	A. F. Rankin	Shaft sunk and equipped with hoisting apparatus and a tramroad built to track.
	W. O. Ward	New hoisting tower built and gin repaired.
	H. Washington	Five new pit cars built.
St. Clair	L. L. Griggs	Opened new slope and built one house.
	John Knierim	New shaft equipped with hoisting apparatus, with all new buildings, 10 horse-power boiler and a jet pump.
Vernon	Central Coal & Coke Co	Sunk shaft, developed and equiped mine No. 19; machinery engine house and pit head built, a fan set and a mile of railroad constructed.
	Rush Coal Co.	Mine opened, shaft sunk and engines and boilers set, and pit head tipple and weigh-house constructed; escape shaft sunk and fan set; 50 pit-cars made and two miles of railroad built.

TABLE NO. 4.

Summary of classified improvements at the mines for year ending December 31, 1901.

Blacksmith shops	
Boilers	
Boiler-houses (new)	
Cages	
Catches on cages	
Coal chutes	
Drifts	
Electric motors	
Electric plants	
Electric long-wall machines	
Engines (new)	
Fans erected	
Fan-house	
Furnaces built	
Horse-power	
Head-houses	
Houses built for miners	
Iron track substituted for wood	
Machinery (new)	
Machine shops	
Mines (new)	
Pit-cars built and renewed	
Pit-heads erected	
Pumps	
Pump-houses	
Pump-shaft	
Platform	
Ropes (hoisting)	
Scales	
Screens	
Shafts (new)	
Shafts (air and escapement)	
Shafts retimbered	
Side-track (feet)	1,8
Stairways in escape-shafts	
Store-house	
Tipple-houses	
Trestles	
Slope-openings	
Weigh-houses	

CONVENTION OF MINERS AND OPERATORS.

The first annual conference of the miners and operators of the State was held at Kansas City during the month of June, 1901. Two former conventions had been held between the United Mine Workers' Association and the operators, but this was the first conference in which our operators and miners met in joint session, as district No. 25 has been established since the convention of the previous year. The object of these conferences are to meet, discuss and agree upon a scale of wages to govern the mine workers during the ensuing year. This conference was well attended, and brought about excellent results, but was not so harmoniously conducted as its worthy object deserved. The United Mine Workers' Association of America during its four years of existence has worked great good in behalf of the miners of this State. Wages, compared with a few years past, are higher, the conditions under which miners have labored have been somewhat mitigated and many of the hardships and disadvantages under which they have suffered have been banished, while the hours of labor have been shortened and greater comfort enjoyed. The old feeling of discontent has been greatly minimized, although not entirely exterpated, and I am safe in the statement that never in the history of coal mining in this State has a more perfect harmony existed between employer and employe than has been experienced during the past year. By the exercise of the same conservative and prudent management as that controling the actions of the miners' organization during the past year, the organization will grow not only in power and influence within its own membership, but it will expand, gathering additions everywhere and in the end create public sentiment in its favor all along the line. That this may be the happy consummation of its aims and purpose, it is all important and an absolute necessity, that cool headed prudent men of the best ability be placed in its official and executive positions.

Our mines have been remarkably active throughout the State during the past year and all local troubles have been adjusted with very little friction or ill-feeling.

The officers of the miners' organizations have been conservative to that degree, that they have won the confidence of the operators and while we feel that the members of the organization have been greatly benefited, so have the operators.

The schedule of wages and the differential between the various coal seams and the class of labor performed, has been equally adjusted and no one operator has any advantage over another in the market, as every operator under the arrangement has to pay a like equivalent price to his employes for work performed.

Following is the agreement arrived at and settled upon at the last conference, and has thus far, from what we can learn, proven satisfactory to both parties:

CONTRACT
BETWEEN
OPERATORS AND MINERS
OF
DISTRICT 25
United Mine Workers of America

For the Year Beginning September 1, 1901, and Ending August 31, 1902.

Be it Resolved, By the operators of the State of Missouri, and Leavenworth County, Kansas, at a meeting assembled at Kansas City, Mo., this 27th day of July, 1901, that we hereby empower and authorize Geo. W. Kierstead, the chairman of our Scale Committee, to execute the following contract, which has been agreed upon and approved by the joint conference of operators and miners.

(Signed) JOHN H. BOVARD,
President Missouri Operators' Association.

Adopted 8:30 p. m., July 27.

Be it Resolved, By the United Mine Workers of America, District 25, at a meeting assembled at Kansas City, Mo., this 27th day of July, 1901, that we hereby empower and authorize our president to execute the following contract which has been agreed upon and approved by the joint conference of operators and miners.

(Signed) GEORGE RICHARDS,
President District No. 25, U. M. W. of A.

Approved by convention, July 27th, 1901.
GEO. MANUEL, Secretary.

CONTRACT.

WHEREAS, a contract between the operators of a portion of the coal fields located in the State of Missouri and Leavenworth County, Kansas, and the miners and mine laborers employed by them, represented by the United Mine Workers of America, has been in effect during the year ending *September 1st, A. D. 1901*; and

WHEREAS, for the purpose of mutual protection, it is deemed for the best interest of all parties to continue a contract for another year;

THEREFORE, this agreement made and entered into this 27th day of July, A. D. 1901, by and between the operators, by their duly authorized representatives, parties of the first part, and their employes, represented by the United Mine Workers of America, parties of the second part, WITNESSETH:

ARTICLE I.

That the following prices per ton of two thousand pounds shall be paid by the parties of the first part and received by the parties of the second part for mine run coal, for a period of one year from September 1st, A. D. 1901, to August 31st, 1902:

SUB-DISTRICT I.

ARTICLE II.

Section 1. Macon and Randolph Counties, Missouri; also all thick veins in Lafayette County, Missouri, prices as follows:

(a) Bevier, Ardmore, Huntsville, Moberly, Santiago, Higbee, Kimberly and associated mines 60 cents per ton for standard coal. For coal 3 ft. 6in. to 3 ft. shall be 65 cents per ton. Coal 3 ft. and under shall be considered as deficient work.

(b) Lingo and associated mines the price shall be 75 cents per ton; this to include bench rock under all conditions.

(c) Waverly and associated mines, the price shall be 70 cents per ton.

(d) Higbee and Elliott and associated mines, (long wall work) the price shall be 85 cents per ton.

ARTICLE III.

In all mines in Sub-District No. 1 the price of entry yardage shall be as follows:

Section 1. Bevier, Ardmore, Huntsville, Moberly, Santiago, Higbee, Kimberly and associated mines:

(a) 7 ft. entry, $1.02 per yard; 12 ft. entry, 58 cents per yard.

(b) Brushing entries 5 ft. high from the rail, 58 cents per yard.

(c) Cross cuts between rooms to be paid for at 58 cents per yard.

(d) Cross cuts between entries shall be paid for at entry price.

Nothing shall be allowed for storing dirt, the yardage allowed being equivalent.

(e) Room turning, $2.65 each, turned 6 ft. wide and driven 9 ft. *before widening. All over* 9 ft. to be paid for at entry price.

(f) Clay stratas or horsebacks, $1.16 per foot.

Section 2. Lingo, Macon county. (Long wall work.)

(a) The price of yardage on entries and gob rooms used as air courses shall be $1.38 per yard.

(b) All other conditions same as last year.

Section 3. Higbee and Elliott, Randolph county. (Long wall work.)

(a) For room turning, room considered turned as soon as switch crib is in, $4.25 each.

(b) For room opening, $2.50 per side, the company to clean the the road head.

(c) Building switch cribs, 55 cents each.

(d) Brushing in entries and rooms not less than 16 in. to be taken, 25 cents per yard.

SUB-DISTRICT II.

ARTICLE IV.

Section 1. In Lafayette county, long wall work shall be $1.00 per ton, and the company to take all coal from the face where loaded and place empties to be re-loaded from where the coal was taken, except at Corder where the same conditions as for the past year shall prevail, except the cutting of dry corners in rooms, which shall be $1.00 per yard. Questions concerning black jack and pushing of the home box at Corder shall be referred back to the local for settlement.

Section 2. Where black jack appears in a room at Higginsville, it shall be paid for same as mine run coal, the same to be guessed off by the pit boss and the miner in whose room it appears; the black jack to be put in the gob, provided there is sufficient room, otherwise to be loaded out and dumped.

Section 3. In Ray county (long wall work) the price shall be $1.00 per ton.

Conditions to remain same as during the past year.

Section 4. In Clay county (long wall work) shall be $1.00 per ton. Conditions to be the same as in Ray county.

Section 5. In Linn county, Marceline, (long wall work) shall be $1.05 per ton. All sulphur and other impurities to be stowed in the working place where possible.

(a) Room turning, $4.24 each.

(b) Entry turning, $4.24 each.

(c) All other conditions to remain the same as last year, except that as soon as practicable the working face shall be 50 ft. to each room.

Section 6. In Jackson county, Brush Creek, (upper vein, long wall work) shall be $1.05 per ton.

(a) All other conditions to be the same as were in effect last year.

Section 7. In Sub-District 2 at mines where machines are now or may hereafter be installed, the price for loading after the machines shall be three-fifths of the price paid for pick mining.

SUB-DISTRICT III.

ARTICLE V.

At Leavenworth and Leavenworth county, Kansas, prices as follows:

Section 1. 84 cents per ton for 2,000 pounds of mine run coal.

Section 2. That a uniform price for dead work shall be paid as follows:

(a) Entry brushing, $1.15 per yard for entries 6 ft. high and 6 ft. wide at top and bottom.

(b) Sulphur in Entries: In addition to the regular price for entry brushing there shall be paid for sulphur in entries as follows:

6 in. at 50 cents per yard; 12 in. at 75 cents per yard; 18 in. at $1.25 per yard; 24 in. at $1.50 per yard; 30 in. at $1.75 per yard; 36 in. $2 per yard.

(c) For sulphur in rooms as follows:

6 in. at 50 cents per yard; 12 in. at 75 cents per yard; 18 in. at $1.25 per yard; 24 in. at $1.75 per yard; 30 in. at $2 per yard; 36 in., $2.25 per yard.

(d) For room turning, figures as follows:

For each room turned and driven into the break, $4.00; for each entry turned and driven into the break, $6.00.

(e) Each new room to receive two cars every other trip, one for coal and one for dirt.

(f) Entries to receive two cars every trip, one for coal and one for dirt.

(g) All falls in roadways and entries to be cleaned up by the company; also all fallen rooms to be cleaned up by the company.

Section 3. At all new mines where the workings have not taken the regular weight or break, the price now paid by the Carr Coal Mining company for mining coal, entry and dead work shall prevail in full force and effect until such time as said new mines have taken their regular weight or break, at which time the prices for mining coal, entry and dead work in sections 1 and 2 of article 5 shall govern.

All other conditions to be the same as was in effect last year.

SUB-DISTRICT IV.

ARTICLE VI.

Section 1. In Trenton and Grundy county and associated mines the price for mining shall be \$1.15 per ton.

a) For brushing cross entries, \$1.00 per yard.

(b) For brushing straight entries, 75 cents per yard.

(c) For brushing all rooms, 50 cents per yard.

(d) In rooms where soap stone and black bat exist, 1¾ cents for each inch in thickness shall be paid per yard in addition to the 50 cents per yard, measurement to be made in the center of the room.

(e) Room roads shall be cut off at 175 feet. If made longer the company shall pay a reasonable compensation for additional length.

(f) Where stump rock runs down in the bottom or up into the top, the company will pay \$1.00 each and furnish powder for taking the same out.

(g) Where cross entries are turned off from straights \$2.00 shall be paid for making room to turn such entry.

Section 2. In Novinger, Danforth, Midland No. 2 and associated mines, Adair county, the price for mining shall be 65 cents per ton.

(a) 7 to 8 ft. entry, \$1.56 per yard.

(b) 12 ft. entry, \$1.06 per yard.

(c) Cross cuts same as entry.

(d) Entry brushing, 53 cents per yard.

(e) For room turning, \$2.91 each. Rooms to be 7 ft. neck. All over at entry price.

(f) Clay and rock to be paid for as to be agreed upon between the miner and pit boss.

Section 3. In Midland No. 1 the price for mining shall be 65 cents per ton for coal 39 inches or over, 70 cents per ton for coal 36 inches to 39 inches, 75 cents for coal 36 inches or under.

All measurements to be made from bottom of coal to top of coal.

(a) 7 and 8 ft. entry, \$1.56 per yard.

(b) 12 ft. entry, \$1.06 per yard.

(c) Cross cuts same as entries.

(d) Entry brushing, 74 cents per yard.

(e) For room turning, \$2.91 each. Rooms to be 7 ft. neck. All over at entry price.

(f) Clay and rock paid for as to be agreed upon between the miner and the pit boss.

(g) Provided that where the strata of coal at any place where any

entry is being run, measured as aforesaid, is 39 inches or upwards in thickness, the price of brushing in such part of such entry shall be the same as provided for at Danforth, Novinger and Midland No. 2.

Section 4. In Stahl and associated mines the price for mining shall be for mine run coal, 82½ cents per ton of 2,000 pounds.

(a) Price paid for dead work as follows:

7 ft. entries, $1.21 9-10 per yard; 12 ft. entries, 79½ cents per yard; 14 ft. doorways, $1.59 per yard.

(b) Brushing, first foot in thickness, 42 4-10 cents per yard. And for each additional foot in thickness, 31 8-10 cents per yard.

(c) Low faulty coal, $3.18 per yard, company to get the coal; or $2.12 per yard, miner to get the coal.

(d) Rock brushing in entries $1.85½ per cents per yard.

(e) Rock brushing in rooms, $1.32½ cents per yard.

(f) Room turning in room and pillar work shall be $2.00 per doorway.

Miners shall brush to the rock when same does not exceed 2 feet in thickness and build two good walls.

(g) Company shall put in all cribs except in long wall or loose ended work, or pay for the same 50 cents per crib.

(h) In long wall the miners shall push loads to first switch; in room and pillar work to entry switch.

(i) Cutting rib in long wall shall be 40 cents per yard.

(j) Increased price for black bat and bony coal is waived, but the slips will be paid for at $1.00 per foot (nothing under 3 inches) and payment shall be made when the room is clear of said slip.

(k) Slips that run parallel with the room, or nearly so, shall be paid at the rate of $1.00 per foot thick, for every fifteen feet, nothing under three inches in thickness. The miner and the pit boss shall decide as to whether the slip is running parallel or nearly so.

(l) Company shall have the right to double shift narrow work when they wish, and to pay 25 cents per yard extra, all told, and local union not to interfere therewith.

(m) In case a place gets behind in long wall the pit committee will see that same is caught up.

(n) Iron tracks shall be laid in all new rooms by the company.

(o) When a room is driven 150 feet it shall be declared driven up, and if the skip entry is not ready to cut it off, the miner shall have the best vacant place in the mine, providing he picks his place the following day, and returns to his new branch when it is ready. If the company desires for any reason todrive the room more than 150 feet, the company to take all coal from a point 150 feet from the working switch and place empty cars at the same point.

(p) When timbers are ordered by the miner before 10 a. m. they shall be delivered the same day providing the mine continues in operation, or the company is responsible for the room.

SUB-DISTRICT V.

ARTICLE VII.

Boone, Callaway, Audrain and Ralls counties, prices as follows:

Section 1. Price for mining at Vandalia, Farber, Martinsburg, Perry and associated mines shall be 91 cents per ton of 2,000 pounds.

Section 2. Dead work shall be paid for, and conditions remain the same in District No. 5 as prevailed in Vandalia last year.

DAY WAGE SCALE.

ARTICLE VIII.

Section 1. Prices for day work shall be as follows, covering the entire 25th district:

Sinkers, not less than $2.40 per day or 30 cents per hour.
Machine runners, $2.25 per day.
Track layers, $2.25 per day.
Timbermen, $2.25 per day.
Pushers, $2.05 per day.
Trip riders, $2.05 per day.
Cagers, $2.05 per day.
Water bailers, $2.05 per day.
Drivers (for single mule), $2.05 per day.
(10 cents extra for each additional mule.)
Trappers, $1.00 per day.
All other classes of underground work, $2.05 per day.

Section 2. The operators shall have the right to employ boys to do such labor as they are able to perform, such as greasing, spragging, making up trips, or any other miscellaneous work not otherwise specified, if they so elect, and when so employed shall be paid at the rate of $1 to $1.65 per day as may be mutually agreed upon by the parties interested, provided, that no work be assigned to such boys that is recognized as a man's work.

Section 3. That the wages of blacksmiths at mines where construction work is being carried on shall be $2.50 per day and the wages of mine blacksmiths at mines where repairs and sharpening of tools only is done, shall be $2.25 per day, based on an eight hour day.

Section 4. That the wages of topmen shall be 20 cents per hour.

ARTICLE IX.

GENERAL PROVISIONS.

Section 1. The scale of prices for mining per ton of 2,000 pounds hand picked, and run of mine coal, is understood in every case to be coal free from slate, dirt, bone, sulphur, black jack and other impurities.

The system of paying for coal before screening was intended to obviate the many contentions incident to the use of screens, and was not inteded to encourage unworkmanlike methods of mining or blasting coal, or to decrease the proportion of screened lump coal and the operators are hereby guaranteed the hearty support and co-operation of the United Mine Workers of America, and all parties to this contract in disciplining any miner who from ignorance or carelessness, or other cause, fails to properly mine, shoot, or load his coal; therefore, in case slate, dirt, bone, sulphur, black jack, or other impurities are sent up by the miner, it shall be the duty of the trimmer of the car, or other person whom the operator may designate, to call the attention of the weighman and check weighman to the same, and the miner so offending shall, for the first offense, be suspended for one day, or fined $1.00 at the option of the operator; for the second offense he shall be suspended for three working days, or fined $2.00, at the option of the operator; for the third offense and each subsequent offense occurring in any one month, he shall be discharged, suspended, or fined $4.00, at the option of the operator.

Any miner abusing or seeking to embarrass the trimmer, or any other person for performing his duty in this respect, shall be fined $3.00 or discharged without recourse, at the option of the operator. All fines imposed shall be collected by the operator through the office, and shall be paid into the treasury of the local union, and under no circumstances shall fines be remitted or refunded by the local union.

Section 2. That the doctor's system shall not be compulsory, but shall be left optional with the men.

Section 3. That all necessary timber and rails shall be delivered at the working switch of each place by the company.

Section 4. The operators agree to check off all general dues and assessments of all miners and mine laborers when desired by any local union in district 25. The check weighman shall have a check number in order to receive his pay, the same as the miner, and all locals desiring a check number for dues and assessments shall be granted the same, and in no case shall compensation be charged for such deductions.

Where no check weighman is employed by the miners the company agrees to check off all dues and assessments of all miners and day men.

The check weighman or any person designated shall put into the office a list of all dues and levies five days before pay day.

Section 5. Eight hours actual work shall constitute a day's work, and it is definitely understood that this shall mean eight hours work at the face, exclusive of the time taken for meals or nooning, or in going to or coming from the face or place of working, and no local ruling shall in any way affect this agreement, or impose conditions affecting the same. All day, or company men, shall perform whatever labor the foreman may direct.

Drivers shall take their mules to and from the stables, harness and unharness them, and the time required in so doing shall not include any part of the day's work, their work beginning at the place at which they receive the empty cars, but in no case shall the driver's time be docked while he is waitin for cars at the point named.

Section 6. The color line shall not be a bar to employment.

Section 7. The price of powder shall remain at $2.00 per keg during the life of this contract and the powder shall be of the standard brands, and of the best quality for the purpose for which it is used.

Section 8. That the erection of head frames, buildings, scales, machinery, railroad switches, etc., necessary for the completion of a plant to hoist coal, all being in the nature of construction work, are to be excluded from the jurisdiction of the United Mine Workers of America Extensive repairs to, or rebuilding the same class of work, shall also be included in the same exception; provided, any or all members of the United Mine Workers of America, who may be employed at such construction work shall not be asked to work in conflict with the terms of this agreement as to hours worked or wages received.

Section 9. The operators in Leavenworth county, Kansas, reserve the right to discharge any miner or miners whose net ton of 2,000 pounds run of mine coal will not yield the same percentage of lump coal as that produced when mines were operated on the screened coal system. Said screens to be regulation dimensions. This section shall not apply where extraordinary squeezes or weight occur.

Section 10. Blacksmithing in the 25th District shall be paid for at 20 per cent. less than the prices that prevailed in the district last year, and under the present contract.

Section 11. That the pay day shall be semi-monthly, and payable not later than ten days after the close of each semi-monthly pay period. The company to furnish a statement of account for each pay day.

Section 12. There shall be a pit committee for each mine, said pit committee shall consist of three employes employed in the respective mine which they represent. No person shall serve on any committee who has not been continuously for at least two months in the employ of the company operating the mine.

The pit committee in the discharge of its duties shall, under no circumstances, go around the mine for any cause whatever unless called on by the pit boss or a miner or mine laborer who may have grievance that he cannot settle with the pit boss.

Members of the pit committee employed as day men shall not leave their places of duty during working hours except by permission of the operator. The operator or his superintendent shall be respected in the management of the mine and the direction of the working force. The right to hire must also include the right to discharge. It is not the purpose of this agreement to abridge the rights of the employer in either of these respects.

The foregoing shall not be construed to prohibit the pit committee from looking after the membership dues or initiation in any proper manner.

Section 13. There shall be no new demands made locally that are in conflict with the provisions of this agreement, and no new conditions imposed affecting the same.

Section 14. Whenever a difficulty arises between a miner or mine laborer and an operator, or between the local union and an operator, which cannot be settled by the mine officers and the pit committee, the same shall be referred to the district executive board and the mine superintendent for an adjustment, and if said executive board and mine superintendent shall be unable to settle the same, then the parties interested shall each appoint two members for a board of arbitration, and these four, if necessary, when they cannot agree, shall choose a fifth member. The mine or mines, miner or miners, or mine laborers, shall continue at work, pending a decision of said board of arbitration, and whatever decision shall be reached by a majority of said board, shall be final and binding upon all parties to said arbitration.

Section 15. Whenever a miner believes he has been unjustly dealt with on account of the charge of producing too large a percentage of nut and slack coal in his run of mine coal, he shall have the right to appeal to a board of arbitration, and shall at once serve written notice of appeal on the superintendent; said miner to continue at work pending the settlement of this case before said board of arbitration and their decision shall be final and binding. Whenever any employe or employes at a mine or mines, working under this agreement, shall cause a stoppage of work in violation of the provisions of this contract, he or they shall be subject to discharge by the company affected.

Section 16. In case of any matter up for arbitration, said arbitraion must take place as soon as practicable and a decision rendered withn twenty days.

Section 17. The right of all operators of contracting any work in or about the mines, except the mining of coal, is conceded, and shall not be interfered with; the contractor to be governed by the scale as to prices and hours of labor.

Section 18. When a working day is cut short by premature firing on the part of the miner, he shall be discharged for the offense.

Section 19. All miners employed in room and pillar work and in ong wall mines, are to use due and workmanlike care to keep their rooms fase. After a miner has properly timbered his room once to the satisfaction of the mine manager, he shall not be required to re-timber or care for the roadway or any part of said room between the switch and a distance of fifteen feet back from the face of said room. The miner agrees to be responsible for the care of said last 15 feet of his room, except where cross bars are necessary, then for the cross bars put up by said miner he shall receive the regular day wage per hour, or the company may perform such work at their option, which shall be done within a reasonable time, provided that in case a room should run into extraordinary bad roof, and after due care on the part of the miner, said room should cave in within the distance prescribed in the foregoing, then the company shall furnish the labor to clean up and secure said room.

Section 20. In the event of an instantaneous death by accident in the mine, the miners and underground employes shall have the privilege of discontinuing work for the remainder of that day and the day of burial. In case an operator elects to operate the mine on the day of a funeral, individual miners and underground employes' may, at their option, absent themselves from work for the purpose of attending such funeral, but not otherwise, except in cases of fatal accident as above. The mine shall, in no case, be thrown idle because of any death or funeral, but in case of the death of an employe, or member of his family, any individual employe may, at his option, absent himself from work for the sake of attending such funeral, but not otherwise.

Section 21. If any employe or employes shall cause the stoppage of work in violation of this contract, he shall be subject to discharge by the company, without recourse.

Section 22. When at any mine of a party to this contract, there shall be three railroad cars empty and available to be loaded with coal, the men shall be required to enter the mine and put the same in operation.

Section 23. When a mine, or any part of a mine, is closed down, throwing men out of work, they are to be employed in any other mine that may be operating at that time by the same company, they to be the first to be taken on when this place resumes work.

Section 24. When a man is taken from the face to drive a mule, he shall be paid $2.25 per day.

Section 25. The district president in company with a national officer, shall go to Higginsville, Mo., as soon as possible, and investigate the grievance of Mr. Beatty, president of the Farmers' Coal company, in regard to men loading machine coal and pushing the same, and whatever decision is arrived at upon the matter, shall be lived up to by the men at Higginsville.

Section 26. In the third sub-district, Leavenworth county, Kansas, in all working places that are behind and deficient, the miner working in such places shall have the privilege of working the same at company wages instead of, as has been the custom, that the place be worked by company men.

Section 27. Where a miner works at the face by the day, his wages shall be $2.25 per day.

Section 28. It is agreed that on the first Monday in April, 1902, the operators and miners represented by the executive board and parties to this agreement respectively, shall meet on that day in Kansas City, Mo., and go into session and continue in session to agree upon and formulate a new contract.

We, the undersigned representative of the operators, party of the first part, having been duly authorized by resolution, a copy of which is hereto attached and made a part hereof, and the representative of the United Mine Workers of America, party of the second part, having been duly authorized by resolution, a copy of which is hereto attached and made a part hereof, have read the foregoing contract and fully approve of the provisions therein contained, and bind ourselves and those we represent to the faithful performance of the same.

GEO. W. KIERSTEAD,
GEORGE RICHARDS,
President District No. 25, U. M. W. of A.

July 27, 11:13 p. m.

The reader in looking over the scale of prices as above, will discover no advance made in the price paid for mining except in the low coal districts, embraced by the counties of Clay, Grundy, Linn, Lafayette and Ray. A complete understanding of the conditions prevailing in all of our mines and my familiarity with the details connected with all under*ground* work in the same, justifies the statement on my part—that the miners at work in some of the mines where the high coal seams prevail, are benefited far more by the adoption of the general provisions of the new scale as above furnished, than they would have been by an advance of 5 cents per ton under the other provisions. After a careful examination of the scale agreed upon I am convinced it is based upon justice and equity and congratulate all parties participating in the good cause. The time and money spent in working out the details and reaching such satisfactory conclusions, we imagine has been more than offset by the splendid results following their deliberations and conclusions.

The organization now so generally known and recognized as the United Mine Workers Association of America, has proven itself the most successful organization so far introduced to coal miners. It has reached every mining camp in the State and its strength and effectiveness is most manifest. Judiciously managed it will undoubtedly prove a great factor for good, the welfare of the miner and a mighty power in the maintenance of peace, justice and harmony—diverted from such aims by the intrduction of a radical, reckless and imprudent management it will fall beyond recovery—as it will array against it every element of decency, fairness and justice. There are limits to every movement and every organization, a nation that at one time boasted that it had conquered and controled the then known world, was lost and disrupted by reason of its corruption and just such end awaits all organizations that are not based upon equal rights and justice. Organization is the natural sequence in opposition to oppression, people have banded together for mutual protection during all time and it is eminently proper and right for miners to protect themselves against greed, selfishness and oppression; but at the same time there should not on their part, be any attempt to engage organized effort to gratify personal greed and selfishness at the expense of others, for in so doing they themselves become the oppressors. Extreme and oppressive measures will not and cannot stand in this enlightened age.

The inspector because of his official position must of necessity occupy a neutral position and at best can do no more than advise. If called upon to give his opinion relative to the miners' great organization he could not do so in stronger terms than he has already done in this article, he would add, however, in the interest of the organization and its future success, that the most important consideration in that connection, is the cultivation of a spirit of fairness throughout the organization; the selection of its officials from men whose temperament, judgment and experience best qualifies them for the very important duties assigned them. All that class of men who are extreme in their views, excitable and always finding fault *should* be avoided and discountenanced in the make-up of *organization officials.*

The miners' union was first organized through the efforts of honest, conservative, fair-minded men, who realized the perils confronting the coal miner by that steady drift to starvation prices and no means of preventing it. The unions thus organized have been nurished and sustained largely by the character of men described, with the result that they are a power for good when wisely officered. In sending men to conventions pass over the heads of that young element of wild and untamed radicals and select the thoughtful, prudent, experienced miner that thinks right, acts right and wants right, then we shall witness that community of interests that means peace, harmony and justice.

If an experience etending over a half century and during all of that time intimately associated with the miners, working side by side with them in every kind and class of work performed in a mine and sharing with them all the hardships and trials met with in coal mines, counts for anything in forming an opinion of those things which constitute miners' rights and privileges; then I can without egotism, lay claim to a reasonably good opinion concerning such rights. Thus fortified and with the single aim in view of bettering the condition of my fellow miners and entrenching them in their organized capacity upon good solid ground—would at the very start, impress upon them the unquestioned necessity of organized effort based upon equity and justice. If the miner wishes to preserve his rights and secure his just dues, he must in order to combat the power and influence of powerful corporations, organize, as it is the surest and best defense that they can bring to their aid. Such organization controlled and governed by prudent men in their official position, will do more to ward off oppression and injustice than any other known method, and that, too, without any particular effort on its part, for its power simply, discreetly managed, cannot be ignored and no greater folly could be indulged in than that of permitting so powerful an engine to be wrecked by placing at the throttle impractical engineers. On the other hand, for there are two sides to all questions, a company investing its money in coal lands, in opening up and equipping mines, in furnishing employment for labor, and that company mutually agreeing to a scale of prices and living up to every requirement in that scale, is in the very nature of things entitled to certain rights also. Among which is the inalienable right to manage and control its own property without dictation from those who have no property right or legal interest therein. Now this does not contemplate the surrender of a single right due to the miner, for how can any one surrender that which he has neither hold upon or possession of. Neither do the rights as named furnish a company any right or power to use oppressive measures. The respective rights as mentioned and due to each, are separate and distinct propositions and this view of the situation should never be lost sight of by either the miners or operators in formulating their plans for governing the work in a mine. No one should question the right of the miners in demanding just and due compensation for their services, that their working places be made as safe, healthy and as comfortable as conditions will permit them to be and that their hours of labor should be short to compensate in a manner for the dark, dismal and dangerous conditions surrounding their hours of toil. Then again there are miners in almost every mine (and their number unfortunately is increasing) who think it smart to originate any scheme which will in the end add an additional expense to the operator—never stopping to consider where such action in its last analysis will end; did they but think how easy it would be to trace it to the ton of coal, there to find that each cent added to the cost of handling a ton of coal cuts the margin of profit, and that it is this margin of profit that determines the price that can be paid for mining this same coal. All large mines must have their foreman, some one must be at the head to direct and control or chaos would prevail, and almost invariably these foremen come from the ranks of the miner. No man can manage any large enterprise, coal mines as well as other lines of business, who does not have system, discipline and respect shown the foreman, if things are to run smoothly; now because this foreman may have been a miner—is it possible that miners will for this reason show him less respect, than they would one placed over them who had enjoyed more of the better things of life? This I am sorry to state is an occurrence too frequently met with in our mines, and it should be frowned down by every well disposed miner.

To ignore a foreman and treat him with disrespect destroys discipline, with the result that the entire mine must suffer from that lack of attention due solely to a want of attention. No good foreman, if he knows his business, will mistreat a practical, well disposed miner—this being so it follows; that the deserving miner will command the fairest treatment, it will be observed the troubles originating in a mine do not originate from this class, except where some well defined wrong is attempted; but that it lies at the door of the devilish riff-raff, who, recognizing their incompetency, court troubles to even up as it were—it is this unworthy class that often causes reproach to be heaped upon the good name of a miner. With the great number of men in our mines, what folly it is to assume that they are all good men or good miners and the same holds good in all the walks of life. In all large aggregations of men there will be found the lazy, careless and unworthy of their class and no one will be bold enough to say that the miners are an exception to this rule. We do not imagine that the miners' organization will meet with any more success in the attempt to place all miners on a common level, than has been the attempt to place the negro on a social equality with the white people. The miners' organization could not possibly strengthen itself more successfully than by weeding out the unskilled, the unscrupulous and the degraded. The inspector now finds himself confronted by a like problem—as he upon an investigation as to the cause of so many accidents in certain mines, found that the true cause was in the employment of so many unskilled men and he has determined to employ every agency, power and influence that he can command to not only stop that kind of business but to force such characters out of the mines, and the miners are expected to lend their influence and aid to this end.

The writer in his younger days with that spirit of unrest so common to those in search of the "White Mountains," was carried forward from place to place in this pursuit, to find himself frequently strapped and compelled to seek employment in order to replenish his empty pocketbook. In every such instance he was fortunate enough to find some employer good enough and kind enough to furnish him work, and he thanks God, that he has never yet felt inclined to harbor the thought that either one of the employers was an enemy. In this day and generation, however, we find an undue prejudice existing towards all employers, no matter whether they be good or bad; such prejudices as were never conceived by the industrious wage-earner, but born of those characters who are at war with good government, morals and decency, and largely assisted by that class in the editorial chair, who prefer, for revenue, to appeal to prejudice rather than reason, posing thus cheaply as champions of labor for no other purpose than to add to their subscription lists; breeding strife and discontent by warning the craft to prepare for the enemy by sharpening their steel and put down the tyrants and oppressors. They mean by the enemy, the tyrant and the oppressors, one and the same, or in other words, the employers of labor. Who are these employers and operators? Are there not some of them who have come from the ranks of labor and fully acquainted with their lot in life, and has the simple change from miner to operator worked such a wonderful transformation in his whole nature, that because he is now an operator that he must of necessity have become an enemy of his fellows, a tyrant and oppressor? No, he is just a man yet, like the balance, he has perhaps had better opportunities than some others; but the prime factor after all is the fact that wherever he was placed he took interest in his work, was active and energetic nad he got there Eli. Those things which are unamerican, unpatriotic and unjust will not work in this country and the most damnable thing labor has to contend with is *that unrestrained* effort of the mischief-breeders who are continually giving vent to their venom, filling the air with their warnings and insisting upon the sharpened steel to meet the enemy, when there is no enemy in sight but those who are forever and eternally manufacturing enemies—the same old class and element always found at the forefront when trouble is brewing and as much out of place at a peace conference as the devil would be in heaven.

That which in our opinion will prove of greatest good to the miners' organization and give to it the greatest possible leaverage for maintaining the rights and privileges of the miners, is to secure the moral support of the good people of our State. In times like the present the conditions are ripe for such effort, as we find the small concerns in nearly all branches of trade being gradually restricted and the opportunity for that independence once enjoyed in business pursuits, vanishing as the hydra-headed trusts come more and more to the front. There are a far greater number outside the trusts than can be found in them and it is this great number that we wish to see the miners win to their side, the moral force of which they can command at all times by a righteous demand for what is right and due them. Miners' organization must be reasonable in their demands, discountenance anything that smacks of anarchy, firmly stand by its rights and as firmly grant that which is right.

MINE VENTILATION.

The inspector has again in order to justify his sense of duty, to refer to mine ventilation and it matters not if it should be said that the subject has been worn out and overdone by too many articles. He knows its vital importance to miner, mine, and its absolute necessity to any well regulated and conducted mine and that conditions are met with on his every trip that suggests to him the necessity of continually reminding mine managers of their duty in the matter of ventilation.

While there is not much to be added to former articles; yet there are new features arising each year, as well as new men assuming the duties of a mine manager, both of which command attention each year. The prime reason for further mention of the subject, is the fact that our mines have been greatly benefited by former articles, as their splendid conditions and wonderful improvement along this line attest. It is the knowledge of such results that spurs us on to new efforts, that we may still further do those things which tend to stimulate our mine managers to new zeal in the maintenance of the best possible ventilation in their respective mines. The result of our continued advocacy of certain methods tending to a more perfect ventilation, is readily noticed in the improved conditions *prevailing in all* new air shafts sunk; it will be observed that the new shafts sunk for this purpose are double in sectional area and capacity, that of the former shafts. That ventilating fans have and are rapidly supplanting the furnace; that air-courses are not only very much larger, but that they are kept decidedly cleaner, also that the class of men yearly being appointed as mine managers, indicate that more attention is given to competency and qualification for such positions.

On a recent visit to a large mine in Macon county we found the ventilative current of air distributed throughout the mine by seven separate and distinct currents, each current providing ventilation for as many different groups of miners. To test the efficacy of the respective currents, the air meter was used and we found that each current was so evenly divided that each group of men were receiving their share of the air pure and fresh. At still another large mine in the same county where we found some 300 or more men at work, the ventilation was found so perfect, even on the return of the air, that we decided to examine it, with a view to giving the beefit of this experience in some such public way as we are now doing. In the first place we found that the air current was divided in the most practical way and conducted through the mine in four separate and distinct currents. This, however, wsa greatly assisted in its practical working by the care taken to make air-tight by properly stopping every opening and abandoned place permitting the escape of foul air or any impurities whatever—this then was the method and manner adopted in maintaining the healthy conditions found to exist in this mine and we cannot too highly commend a management that we find working such results in a mine of this size. It is a great pleasure to the inspector when he meets conditions like the above and his earnest desire is to nd every mine foreman in the State exerting himself to place his mine in like condition. Where he finds that the proper ventilation is not provided, how is he, with the knowledge that it can be obtained, to account for its absence, other than classing the foreman as too lazy and indifferent or one that fears the loss of his position to that extent, that he would permit discomfort to his fellows by failing to perform his duties.

The coal mining industry of our State has been making rapid strides and keeps fully abreast with the progress of the times, and while our production is the most noticeable feature in this connection; yet the fact should not be overlooked that it is the progress, the improvements, equipments and enlarged capacity of our mines which has made this result possible. Our mines with their increased development and extension, have required in their operation an increased number of miners and we now find some of them, in which 300 men are at work. With so large a number of men at work deep down in the ground with but two means of exit in the event of trouble underground, occupying rooms covering many acres in extent or stretched along a face of coal sometimes thousands of feet in length, receiving the air they breathe from a down cast shaft while the impure air is forced out through the upcast, must to the thinking man, present a situation at all times demanding the greatest vigilance, practical knowledge and activity, on the part of those entrusted with the care and supervision of a mine in which there is so much at risk. This large number of miners must be supplied continuously with a current of air pure and fresh, if health and vigor is maintained; that this cannot be done when there is so much impurity generated in a mine, without systematic and practical manipulation of the fresh air current is plainly to be seen. With these conditions before us the proper ventilation of a mine becomes a matter of first importance in mine management and should command the best attention of mine officials and the employment of such men as are skilled in such duties, possesssing practical training and ideas, industrious and conscientious in the performance of their duties. Men who are not thus qualified, are alike hurtful to miners and operators. Mine foreman cannot lay claim to any excuse for failure to secure the proper ventilation in their respective mines, except in rare instances, as they have the experience of scientific men who have made a life time study of all the conditions existing, the treatment of the same and the combined experience added, of old and experienced miners, foremen and mine superintendents and who have published for the benfit of all interested, the result of their investigations, together with the best methods to adopt, to meet almost every condition or emergency common to coal mines. With such information so easily obtained, what is to prevent a mine foreman from purchasing some one of the many books published on the subject, and acquainting himself with the details and methods which would be so helpful to him in his work?

The constructors of our ventilating fans in co-operation with experienced mine officials and experts, have been able to detect defects and remedy the same, until today we have one of the most perfect mechanical appliances that can be used in furnishing the best possible ventilation for our mines, and there is therefore no excuse for an operators sacrificing the health and comfort of his employes, because of poor ventilation when such an excellent remedy can be had as our modern fan.

Mine ventilation while apparently plain and easily understood by the practical and experienced mine foreman; yet we are sorry that we are compelled to state that many of them are found who neither understand the principle or attempt to pattern after those who do, and no better evidence of this fact is needed than the conditions of their mines demonstrates. Do men with mines so conducted impress an inspector with the idea that they are possessed with practical ability, with a knowledge of underground work, that they have visited every working place to discover the conditions of the air therein each day and made certain that it was strong enough to overcome the deleterious effects of gases and other impurities, that they had made sure of air tight stoppings at all abandoned places and that all miners were receiving their due proportion of good air?

In the discharge of our duties as inspector all mines in the State are visited and inspected at least twice during the year; but nearly all of the larger ones much more frequently. We necessarily come in contact with all mine foremen and it is astonishing after our long experience how suddenly we can size up a foreman immediately after entering his mine—there are certain ear marks, that either mark him for good or bad. On entering some mines the foreman wlll always be found either looking after ventilation, the safety of rooms or entries, the repair of doors or other work demanding his attention; it is always a pleasure to meet such men for, as a rule, they have their mine up to the requirements of the law or deeply interested in bringing it up to that standard; such men are generally to me relied on and both miner and operator are bneefited by his kind of work. At another mine we either find the foreman tinkering with some old worn out pump, on the pit top looking for an imaginary duty that will keep him out of the wet and in the fresh air; but far more frequently we find him comfortably ensconced at his headquarters along side of a double parting, hurrying the drivers out with their coal regardless of other conditions in the mines: what does he care about sanitary conditions so long as the output shows up well for the day—we pass him on our trip through the mine to find doors in need of repair and wasting the air so much needed in other parts of the mine; we attempt to pass through an air course but find it so well supplied with falls and caves as to furnish not enough room for the air or myself either to pass through, presently we reach a group of miners actually suffering for want of good air, we then turn our attention to the volume of air forced into the mine and at the intake it measures more than enough to supply the demands of the mine—but the men are not getting it. In a case like this there is no difficulty in finding a cause for the poor ventilation, the foreman has been so busy in hustling coal to the shaft bottom that he has not had time to see the air current properly conducted to the working places, to repair doors, stop leaks or clean out air courses. Foremen of this kind may secure the product while the mine is working, there comes a time when his long delayed attention, forces an idleness for repairs to the mine and his increased product may prove a very expensive experiment for the operator, while the very life of his fellows have been undermined by his neglect.

We have exceptional cases to deal with as described, yet the mines of this State are as a rule as well ventilated and kept in as good saintary condition as may be found in any state in this country. Our operators as a rule are very willing to accept the best methods for the betterment of the mines and endeavor to comply strictly with the mining laws of the State.

The most objectionable feature connected with the operation of our mines as I see it today is that pernicious practice indulged in of firing shots at the noon hour each day by the miners, who are themselves not only greatly discomfited, but sometimes most seriously affected by its results. There never has been or doubtless never will be a mechanical contrivance invented or a system of ventilation devised or made use of that will aleviate or molify the evil conditions created by the firing of 150 to 300 shots in a mine at the noon hour each day. To clear a mine of the powder smoke, sulphur and fumes from so many shots, requires far too much time at the noon hour for the miners to submit to it without feeling that they are wasting time and to avoid which, they waste their lives away by going to work too soon thereafter. How strange this condition appears when it is known that the miners themselves are responsible for the creation of the bad atmosphere which they in turn inhale and poison their systems, this, too, in opposition to the most earnest protest of the inspector who cannot possibly have any other object in his protest than their own protection. I sincerely hope that the miners' organization will take up this question which so seriously interferes with the proper ventilation of our mines and the health of miners and end this practice of firing at noon. Were conditions like the above due to any rule eminating from operators, how quickly would a law be introduced to put an end to it, and no one would work harder for its passage than the inspector; but the miner should not forget that there are two sides to all questions, and if they are indulging in any practice which works difficulty in properly ventilating a mine, that they should be the first to protest, especially if there is no other way of escape from its evil effects. Follow the old injunction, "be sure you are right and then go ahead."

MINERS OILS

The burning of a good grade of illuminating oil is as necessary to the health and comfort of a miner, as it is in maintaining good ventilation; yet the miners continue to purchase an inferior grade under the false impression that they are benefited in purchasing it at a cost of 30 or 40 cents on the gallon cheaper. I am constantly receiving letters from miners all over the State, complaining of the inferior grade of oil used in their respective mines. We have also answered several calls in person to discuss the oil question in all its bearings, the evil effects of an inferior oil were pointed out to them and yet at one mine where there were 57 miners at work, a secret ballot was taken to determine their choice between a cheap 50-cent oil and the good winter strained lard oil at 95 cents per gallon; with the result that 19 voted for good oil and 38 of them preferred the common—this was so discouraging that I left the mine powerless to do them any good. The same thing was tried at another mine with similar results, and I concluded that as my efforts were so fruitless that they would have to assume for themselves the troubles they were bound to create.

While at Richmond last fall, we met a large number of the miners individually and in committees, all complaining of the inferior grade of oil used in the mines in the vicinity of Richmond. On my inspection of the mines at this place, we found abundant reason for their complaints. These mines are all worked on the long-wall plan and the air made to travel along the face of the coal or working place; it is no uncommon occurrance to find from 50 to 60 men along this face at work with the light furnished each man coming from a lamp on his cap that is filled with common oil that throws off a dense smoke, the fumes from which are suffocating—then added to this aggregated volume of poisonous fumes, the natural impurities found in a mine with the effects of the combined respiration from such a number of men, who not only inhale a vitiated atmosphere but expel it from the lungs still further vitiated, and we have an atmosphere that not only undermines the health of the miner, but hastens his death.

Noticing the pernicious effects resulting from the use of inferior or low grade oils used in the mines of that section, with but one exception, we suggested to many of the members of the miners' organization the necessity of taking up the oil question in their local unions and if by a full discussion of the matter they could create a sentiment against the use of low grade oil—to adopt a resolution which would require the use of the best grade of oil under a penalty, promising that in the event of such action and the inspector feeling that he had the co-opeartion of the miners, that we would enforce the law to the very limit. Some time after this suggestion was made, a letter was received from the secretary of a local union informing us that the oil question had been up in the meetings several times, but that there was so little interest manifested that nothing as accomplished; there was one suggestion made that might work a betterment of the condition—that was to prevent the shipment of a low grade oil into the State. This would undoubtedly prove a good remedy, but the sooner the miners take the initiative and refuse to purchase the inferior grades of oil, the better, as dealers will not ship it in if there is no sale for it. It is true the laws of our State prohibits the miners from purchasing and using the low grades under a fine and penalty; but the inspector does not fancy playing the part of a detective and enforce the law so far as the miner is concerned, especially when that same law was enacted for their benefit.

The oil law to all intents and purposes is at present virtually a dead letter, and the miners are responsible for the failure to establish a grade—they are the chief violators of the law and the chief sufferers because of such failure.

At a recent visit to the mines at Kimberly, a very general complaint was made concerning the oil. We had a talk with the operators concerning the matter and they promptly agreed to keep constantly on hand a better grade; provided the miners would consent to buy it. We acquainted the local union with the result of our conversation and the promise given, but have never been informed of any action taken in the matter.

There is no law upon the statute books enacted for the benefit of the miner, his health and comfort that is more important to them, and yet there is no other law so grossly and shamefully abused and violated. For two years following the enactment of the law, the inspector earnestly and conscientiously endeavored to enforce its provisions, as he thoroughly appreciated the benefits which the miners would receive from its observance; but he met with such indifferent support from the miners—in fact he was blocked in his efforts to enforce the law, by the persistent use of inferior oils by the miners, this of itself made hopeless any good to result from further effort, and in despair the inspector suspended work in this matter, The remedy is now entirely with the miners, as we feel powerless without their co-operation and as our duties are sufficiently heavy already, our time if so inclined, is too limited to engage in the numerous prosecutions that would result if we attempted to enforce the law. The law is far-reaching, as it not only takes in the dealer who ships the inferior oil into the State, but the store keeper who buys and sells it, the operator allowing its use in the mine and the miner or other employe found burning it in the mines—all are liable to fine and imprisonment. Our miners hereafter were guilty of the use of an unlawful grade of oil, and at the same time demanding better sanitary conditions, should set an example by stamping out one of the chief agents responsible for unhealthy *conditions—that* of cheap low grade oils.

COMPARATIVE TESTS OF THE GENERATION OF STEAM BY COAL AND BY OIL.

The following clipping on the subject is taken from a publication called Coal and Coke, a journal devoted to the coal and coke industry of the country. The great oil gushers of Texas have created not only much excitement, but considerable speculation among coal opreators relative to the possibility of oil supplanting the black diamond as a fuel. The tests made by the railroads as follows may prove of intefest:

BEAUMONT OIL AS FUEL.

Since it was determined that the Beaumont oil consisted largely of ingredients most suitable for its use as fuel, a great many figures have been made of a comparative nature showing the relation of oil to coal, to wood, to sawdust, as fuel; and also treating of the constituent parts of the oil. One peculiarity of this Spindle Top oil is that one may get half a dozen different analyses of it, and all bona fide. It seems that the oil from different wells will give different figures for the component parts, although the variation is not great. To show the great power possessed by the oil as fuel, it can be compared with wood and coal in its heating qualities as follows: Wood contains 40 per cent. of carbon, coal contains 75 per cent. of carbon, while Beaumont oil contains 85 per cent. of carbon, thus showing its great superiority in heating quality. While on this subject, it is interesting to note that while the writer has interviewed a great many of the men who are actual users of oil, he has never yet found one who did not state that there was no lack of heat power; in some instances they got more than they wanted. Possibly a few examples of the saving that has been effected by the use of oil, as compared with coal or other fuel, will be of interest. The International & Great Northern Railway company has made the severest and most thorough test of the oil of any railroad in the state. The test was made on two immense freight engines weighing 83 tons on their drivers, and each of which was given exactly the same run to make, with as near as possible the same number of loads per trip, aggregating equal tonnage. The engine that burned coal was fitted with every known device and improvement for the economical consumption of fuel, including a Bates patent fire-door. The actual figures on this test are as follows, the figures being furnished especially for The Tradesman:

Engine No. 215, burning oil, made 3,322 miles, consumed 705½ barrels of oil, at a cost of 54¾c per barrel, amounting to $386.26; cost per mile, $0.11.63; miles run per barrel, 4.71.

Engine No. 206, burning coal, made 3,322 miles, consuming 182.28 tons of coal, at a cost of $2.71 per ton—$493.98; cost per mile, $0.14.87; miles run per ton, 18.22.

It must be borne in mind that the foregoing test was made with every advantage in favor of coal, whereas there were few advantageous conditions surrounding the oil, for it will be noticed that the oil is figured at a liberal price. Note also the long mileage of the test. Even under these conditions, it will be seen that the oil comes out victor by 21.8 per cent.; and undoubtedly when the International & Great Northern road gets storage tanks built, and a regular contract made for oil, and all other conditions have become as favorable as a permanent use of the fuel would warrant one to expect, the difference would easily be 35 per cent. in favor of oil. This is the hardest test that has been made, and is probably the most reliable. The International & Great Northern road also had to pay freight on its oil. Please remember also that the above figures are for two of the heaviest freight engines in the state of Texas. The oil in this case was consumed on the basis of 3.8 barrels to a ton of coal.

The Santa Fe has given out that 25 passenger and freight engines on a thirty days' run used 2,077 tons of coal, and covered altogether 87,063 miles, equal to about 42 miles per ton. This is a great mileage per ton, and must have been made principally with light passenger trains. Oil at 50c per barrel would cost 4.2c per mile, against 23.2c for the coal. However, these figures are not official, and probably are not correct, as 4c a mile for fuel is almost beyond belief, although undoubtedly a great saving will be made.

SCALE TESTING.

During the legislative session of 1899, a law was enacted which reads as follows:

"That the coal mine inspector of the State be ex officio inspector of weights, measures and scales used at the mines, and he is hereby empowered and it shall be his duty to test the scales used to weigh coal mined in the mines of this State at least every six months, etc." The inspector in connection with the numerous other arduous duties imposed upon him, has endeavored to fully comply with this added duty. During the past year a large number of tests were made and with pleasure make the statement that with very few exceptions they were in the main found correct. Where defects were found a very simple request was only necessary *in each case to* have them corrected. Ever since the enactment of the law, my rule has been and faithfully carried out, to give the earliest attention to all complaints concerning the accuracy of scales. During the first six months of the year calls of this nature were very numerous; my experience proving this duty was one of the most undesirable, expensive both in time and money and the most unpleasant work associated with his duties as inspector. We could enumerate a large number of instances occurring during the past year, wherein we answered hurried calls to inspect mines and scales and found the complaints groundless, and the same calls followed in two or three weeks again, necessitating another tedious and expensive trip, some times making a trip from the Southwest corner of the State to the Northeast and back again. Without fail while out on an inspection trip of the mines we make it a point to inspect the scales, anticipating in this way, any possible difficulty that may lead to an early or for that matter a more remote call—it all takes time and prolongs our trips.

On entering upon our duty as inspector of scales we were poorly equipped with the necessary weights to make the tests and were compelled to resort to all kinds of methods to arrive at the facts or condition of things, as it is impossible for me to attend to other duties and be loaded down with the weights required. I have therefore very respectfully to request operators, that they keep a set of United States standard test weights at the mines. These weights can be purchased for a small amount of money, they will prove a benefit and a satisfaction in testing when disputes arise, or for the information of the operators in testing the accuracy of the scales when the inspector is not at hand—then when we are present it will prove a great convenience.

STRIKES.

The inspector in connection with his other duties is also expected to give special and particular attention to strikes, reporting upon them in detail and noting each individual strike occurring at our coal mines. During the year 1901, but very few strikes occurred and the majority of these were unimportant, lasting not to exceed ten or twelve days.

Of all the strikes that did occur but two were due to a demand for increased pay, viz.: The Co-operative Coal Co., in Henry county and at the Carter Coal Co., in Lafayette county, in both of which the miners were successful. The facts are that in the majority of instances during the year the miners won out on the strike. The strikes originating in Audrain, Ralls and Lafayette counties, were due to a misunderstanding or interpretation of the scale adopted at the Kansas City convention—*they were readily* righted and at the time of our preparing these notes may be called settled and all working smoothly and harmoniously between employer and employe.

The following references to strikes by counties—point to the cause, duration, number of men engaged in them, the name of operator or mine where the strike occurred and how the strike terminated.

AUDRAIN AND RALLS COUNTY STRIKES.

The mines at Farber, Martinsburg, Perry and Vandalia in above named counties, comprise what is known among the miners as Sub-District No. 7. The miners of this district came out on a strike about the 1st of September, because the operator required the miners to do the brushing on the room-wheel roads; this the miners claimed was not contemplated by the Kansas City scale. After the miners had been out about 20 days the matter was submitted to the State Board of Arbitration for settlement. This Board decided in favor of the position taken by the operators. The men abiding by the decision returned to work, there were some 200 or more men involved in the strike.

BATES COUNTY.

On or about the 15th of November, 1901, about two-thirds of the miners employed by the Rich Hill Coal & Mining Co., in its mine No. 15 stopped work and brought on a strike. Upon an investigation of the causes leading to the trouble, we learned that some of the miners agitated the question of a check-weighman, and while there was a wide difference of opinion among them, yet the great majority favored the employment of a check-weighman and made demand upon the superintendent of the company that the check-weighman be put on and that his pay be collected by the company in the same manner that the pay of the doctor and other bills are collected of the miners. The refusal of the superintendent to accede to the request made, created a very bitter feeling between him and the major portion of the miners, which finally resulted in a suspension of work on the part of two-thirds of the miners, the other third continuing at work. The failure to make the strike general caused ill-feeling and guards were provided for the miners who continued work; this state of affairs run along until about the 4th of December, when there was a clash between the strikers and guards. The Governor promptly called the State Board of Arbitration together and had it proceed to Rich Hill, to arbitrate the matter if possible. On the 9th of December the Board succeeded in making a settlement and the men returned to work. There are a number of mines in the Rich Hill field that sell their product straight out to the Rich Hill Coal Co., and as mine No. 15 is the property of this company and the largest mine in the district this caused the fight to center around it, when the miners of No. 15 went out on a strike, the other miners working in mines that sold the product to the Rich Hill Co., went out with those at No. 15 from a sympathetic standpoint and altogether there were about 500 men on a strike, while about 100 remained at work. As already stated the trouble was occasioned over the employment of a check-weighman; but back of all that remains the fact, that the trouble was the outcome of efforts made by leaders in the United Mine Workers' Association, to bring the entire Rich Hill field into this organization. On recent visits of inspection to this field, it was not difficult to recognize the success of the leaders of this organization in the accomplishment of their aims as I found the camp well organized. The inspector believes in and endorses labor organizations, having been a member and a promoter of them and having supported them all through life. He is firmly convinced of their absolute necessity in the preservation of the rights and welfare of the miner. Let any fair-minded man read the Constitution of the United Mine Workers' Association of America, and if he discovers anything therein based upon other than exact justice between man and man we shall be greatly disappointed. Thoughtful, prudent officials at the head of this organization and its branches, will cause it to grow in favor among all classes and its opportunities for doing good are very great.

The controversy at Rich Hill, last December, between the miners at mine No. 15 and the mine officials was very bitter while it lasted and a strike was precipitated from no other cause than a lack of diplomacy, good judgment and a little more modesty on the part of the mine officials. When a mine official having the power to act for his company in any dispute which may arise between employer and employe, assumes that he is possessed with an infallible judgment, that his ideas of right must prevail no matter how the poor miners may construe the situation and that he by reason of his position must be recognized as the arbiter of their rights and privileges, he simply makes plain his arrogance and his indisposition to be reasoned with by his subordinates.

The miners employed in all the mines about Rich Hill were organized some time prior to the time, when the miners at mine No. 15 were taken into the union. After the miners of the last named mine were admitted into the organization, the changes and remedies requested of the mine officials were simple in their nature, just and proper, embracing no radical departure from existing rules; but just some common-place requests that a prudent and judicious mine official would have accepted *had he the true* interest of his company at heart, but unfortunately his pompous self-glorification stood in the way, for should he promptly accede to the requests made he would loose an opportunity to exploit his great importance. There was not a dollar at stake either to win or loose no matter which way the question was settled, neither did the requests of the miners contemplate the surrender of any company rights; they simply asked that they be granted the same privileges at mine No. 15, that were ruleable at other mines in the district. While we do not think it right to deduct in the office of the company from the miner's pay any amount that the miner does not consent to over his signature, yet we can see that there is just as much propriety in the company withholding from the miners' pay, the dues they may request collected for the support of their organization, as it is to collect on coupons issued by outside storekeepers —this view of the case cannot be reasonably disputed.

The Rich Hill Coal Co. operates mines in Arkansas, Indian Territory, Kansas and Missouri, employing in the aggregate 10,000 men or more, all under the management of Maj. R. M. McDowell, of St. Louis, and we believe him one of the most capable men in America today engaged in the coal mining business.

He is thoroughly honest, very conservative, practical and a man of great experience. There are less strikes and less trouble among the employes of the great number of mines under his control than is experienced by any other coal company west of the Mississippi river. No one regreted the unnecessary trouble at Rich Hill more than Major McDowell. The miners employed in the mines of this company in the several states mentioned, have been harmoniously at work for the last two or three years with little or no friction until the difficulties at mine No. 15 arose, this caused quite a commotion throughout the mining districts of the State and considerable loss to the company; but it is hoped the experience will prove a warning to all who were interested.

The employes of the Central Coal & Coke Company, Wise Coal Company and the Pearson Coal Company, all went out on a sympathetic strike on account of mine No. 15 strike. About 500 men were out during the strike, which lasted 25 days and terminated in a compromise.

CLAY COUNTY.

The miners in the employ of the Missouri City Coal Company came out on a strike on the 4th of September last, because of a refusal on the part of the company to take out what is known as the "home box" like it did all the other boxes loaded at the face. The men continued the strike until the 20th of the same month, at which time the officers of the miners' organization decided in accordance with the scale and its provisions in favor of the operators. The men returned to work on same terms and conditions formerly obtaining. Fifty men took part in the strike lasting about two weeks.

HENRY COUNTY.

The miners at work for the Co-Operative Coal Company at Lewis Station came out on the 15th of September last, on the demand for an increased price of ten cents on the ton for mining, remaining out until the 2nd of October. The company conceded the advance and the men returned to work. About 25 men took part in the strike.

The miners in the employ of D. B. Pigg, near Lewis Station, came out on a strike on the 15th of August last on a refusal of a scale to weigh their coal. After being out until the 5th of September they returned to work, having received the scale and gained their point. There were 20 men involved.

LAFAYETTE COUNTY.

The miners employed by the Bonanza Coal Company, the Consolidated Coal Company, the Farmers' Coal Company and the Lowney Coal Company, as well as all others in the mines surrounding Higginsville, came out on a strike on the 6th of September last, because of a misunderstanding in the matter of pushing out the "home box." The executive officers of the miners' organization compromised the difference and the miners returned to work after being out two weeks. There were 250 men engaged in this strike.,

The miners at work for the Carter Coal Company, near Wellington, struck for an advance in the price paid for mining on the 1st of September last. After being out eight days the advance was granted. About 50 men were engaged in this strike.

The employes of the Dover Coal Company came out on a strike September 1st last because of differences concerning the intent of the scale adopted at Kansas City. After being out about 30 days a consultation was had, resulting in the men returning to work on same terms and conditions existing prior to the strike. About 50 men were involved in the strike.

The employes of J. C. McGrew came out on a strike on the 1st of November, 1901. A falling short in the mine weights was claimed, the operator demanding more weight in order to have the cars hold out. The miners struck, refusing to comply with the demand. Officers of the miners' organiation appeared upon the scene and agreeing to see that mine weights would hold good with the railroad weights, the men returned to work. There were 150 men involved.

MINE LEGISLATION.

SUGGESTIONS AND RECOMMENDATIONS.

The mining laws of this State are without question as far-reaching and as effective in providing the protection of the life and limb of the miner as can be found in the laws of any mining state in this country. The gradual decrease year after year in the number of coal mine accidents is the strongest evidence that can be furnished of the good accomplished and the effectiveness of the laws; yet in our opinion several new laws should be enacted, while some of them in existence should be repealed and others amended, with the purpose in view of still further reducing the number of accidents in our mines. To this end your inspector respectfully submits and recommends the following:

In order to secure and maintain a proper and sufficient amount of ventilation in coal mines, that the health and safety of the miners may receive additional protection, it should be required of all coal companies, operators or agents in charge of coal mines in which 50 or more men are employed, shall have added in addition to the usual mine foreman, what we term an over-man, said over-man to be constantly employed and who must be a miner of at least five years' actual experience in coal mining, thoroughly practical, and competent to intelligently perform his duties herein prescribed. The duties of said over-man shall be to visit each day, every working place in the mine or mines when in operation; he shall give special attention to and carefully watch and look after the ventilative current of air and all appliances connected therewith, making it his business to see that all doors are properly hung, that they are located at the proper place, that the same are in good repair and working order, and that additional doors are placed where and when needed; he shall be required to pass through every foot of air-way each day and see to it that all air-courses are kept clean and free from all obstructions of any nature and that as the underground work of the mine is advanced by excavations further into the coal field, it shall be his duty to see that the proper break-throughs are made in accordance with the law relating thereto; he shall see that all loose rock or other unsafe material of any kind that may be found hanging overhead either in the working places of the men, or entries or haul-ways, is taken down promptly or the same made secure by properly timbering the same. The over-man is required to see that a sufficient amount of props, caps and timber of a suitable size —sawed or cut square at both ends and as near the length needed as may be practicable *are constantly* kept where the necessities require them.

Said over-man upon finding an employe wholly incompetent to protect himself and his working place and who may be endangering the lives of those working near him, it shall be his imperative duty to at once place him under the care and supervision of a competent miner or discharge him immediately. In the opinion of the inspector a law covering the foregoing would result in greatly lessening the number of accidents and the extra expense in the employment of such over-man would prove small indeed compared with the good results obtained.

Have also to suggest that sections 8826 and 8827 be again repealed and that the same be so amended as to make them read as they were originally enacted. These sections have heretofore been known to the mining fraternity as the shot-firing law and before they were repealed constituted one of the best laws ever enacted for the protection of the lives of coal miners. Its constitutionality had been tested in our courts and was readily enforced wherever conditions demanded. During the session of 1901, a bill was introduced and passed repealing and amending said sections in the effort to have certain parts of the original apply to lead and zinc mines as well as coal. In the dissection and reconstruction process it was changed as to be altogether inoperative so far as coal mining was concerned. The intention of the author of the change was no doubt to benefit the lead and zinc miners; but the coal miners were lost out in the deal. The law as it now stands could not be tortured into anything resembling its former requirements and is worthless and meaningless when applied to coal mines. Lead and zinc mines are operated upon distinctly different methods with altogether different conditions prevailing under ground. Laws governing the respective mines should clearly read lead and zinc or coal mines and should not except in rare instances refer to all mines, as it often happens that which is good for one kind of a mine is just the opposite for the other. Would suggest in this connection that members of the Legislature on mining committees call into their meetings practical miners to confer with them. The coal miners of this State had a miners' committee present during the entire session of 1901, to look after legislation; they were intelligent, practical men and could have afforded all needed help and could have furnished all the information required.

I would further suggest and also recommend that section 8811 which establishes a code of signals for all mines be so changed that the code as it now stands be so changed as to eliminate coal mines—and that the section be so amended as to provide the following code, applicable only to coal mines:

One Bell—Hoist coal or dirt.

One Bell—To stop when the cage is in motion.

Two Bells—Lower cage.

Three Bells—Hoist men. After ringing three bells and before the men get on the cage the engineer shall blow the whistle twice in answer, then men shall get on cage, ringing one bell for ready.

Four Bells—Hoist mules.

Men in coal mines have grown old accustomed to the above signals, while largely the men in lead and zinc mines are accustomed to the signals under the present law. In fact the change for the coal miners was so radical that I feared to enforce the law—men are such creatures of habit that I doubt not accidents would have happened had the law been enforced. A code of signals is a good thing, as men going from one coal mine to another run no risk. There is another provision in the section relative to covering cages with boiler iron that should be changed. Would suggest that the depth of shaft requiring cages to be covered where coal is hoisted from mines by horse power be changed from 100 feet depth to 25 feet in depth.

Section 8828, having reference to the practical miner, is a good law if it could be enforced, but it must be changed if it ever becomes effective. As the law now stands it places the burden of the duty of examining all applicants as to their qualifications before being allowed to work in a mine on the shoulders of the inspector or some one whom he may designate. Men enter some of the larger mines every day that require examination: but it is a matter of utter impossibility for the inspector to perform such duty without neglecting other more important duties and he cannot designate others to act for him, as there is no fund provided to pay for work of this kind. I see no way out of it except the miners' organization take the matter up and place the work in the hands of the pit committee. Then I could designate the chairman of that committee at each mine to act as examiner of doubtful applicants presenting themselves for work. In this way only, do we see any chance of enforcing this law. In some of our mines this method is practiced and with entire satisfaction.

HEATING VALUES AND PROXIMATE ANALYSIS OF MISSOURI COAL.

We are indebted to Mr. J. H. Waters, deacon and director Agricultural Experimental Station, State University at Columbia, for the following tables showing the heating values and proximate analysis of Missouri coal, as prepared by Professors C. W. Marx, mechanical engineer, and Paul Schweitzer, chemist:

EXPLANATION OF TERMS.

A heat unit is the quantity of heat required to raise the temperature of one pound of water, at its maximum density, one degree Fahrenheit. The expression from and at 212 degrees F. means that the water is taken in at a temperature of 212 degrees Fahrenheit and evaporated at atmospheric pressure. Thus all the heat is used to evaporate the water. This is merely an arbitrary standard used in boiler testing.

In table No. 1, the column headed heat units per pound of coal is the maximum number of heat units that one pound of coal will yield when burned in a furnace where there are no losses of any kind. The number of pounds of water that a pound of coal will evaporate from and at 212 degrees F. depends upon the efficiency of the boiler and furnace. The efficiency of boilers in our western states with the ordinary furnace and setting generally varies from 50 per cent. to 60 per cent., but in a great many cases it is far below 50 per cent. With mechanical stokers, uniform duty, well designed boiler ,and well designed furnace, an efficiency of 70 per cent. is easily maintained. Assuming a boiler efficiency of 60 per cent. the last column in table 1 was computed. It shows the number of pounds of water that one pound of the various coals would evaporate under favorable conditions with such an efficiency (60 per cent.), the water being taken in at 212 degrees F. and evaporated at atmospheric pressure.

Table No. 1 shows the rank of the coals arranged according to their calorific value.

I.—TABLE SHOWING CALFORIFIC VALUE OF MISSOURI COALS.

Rank	Name of mine.	County.	Location.	Thickness of vein in inches	Heat units per pound of coal	Pounds of water evaporated from and at 212° F. per lb. of coal. Boiler efficiency 60 per cent
1	No. 8, Western Coal Co	Barton	Near Minden Station	36	13763	8.55
2	No. 3, Weir Coal Co	"	Near Vernon Station	36	13759	8.55
3	Brush Creek Coal Co. Upper Vein	Jackson	3 miles southeast of Kansas City	16	13710	8.52
4	No. 14, Central Coal and Coke Co	Bates	5 miles south of Rich Hill	60-66	13500	8.38
5	Rush Coal Co	"	5 miles south of Rich Hill 1¼ miles west of previous one	42	12824	7.96
6	Keene	Boone	4½ miles north of Columbia	44	12780	7.94
7	Thompson	Henry	1 mile east of Deepwater	......	12757	7.92
8	Henry	Boone	Switzler	42	12492	7.76
9	Cooper Creek Coal Co	Henry	3½ miles southeast of Deepwater	32-42	12326	7.66
10	Kingston	Caldwell	1 mile north of Kingston	12-18	12292	7.63
11	Caldwell Coal Co	"	2 miles east of Hamilton	18-20	12115	7.52
12	Bowen Bros	Henry	½ mile northeast Louis Station	30	12093	7.51
13	Watkins	"	1½ mile southeast of Clinton	24	12090	7.51
14	Excelsior	Lafayette	½ mile west of Higginsville	16	12010	7.46
15	Vernon Coal Co	Bates	2½ miles southeast of Rich Hill	36-60	11978	7.44
16	Marceline Coal Co	Linn	½ mile south of Marceline	28	11939	7.41
17	Murlin Coal Co	Adair	½ mile north of Stahl	48	11854	7.36
18	No. 15, Rich Hill Coal Co	Bates	2 miles south of Rich Hill	48	11834	7.35
19	Edmonds	Lafayette	¼ mile east of Waterloo	18	11829	7.35
20	No. 6, Farmers Consolidated	"	1 mile west of Higginsville	16	11824	7.34
21	No. 66, Kansas & Texas Coal Co	Macon	3 miles south of Bevier	56	11769	7.31
22	Silver Creek Coal Co	Lafayette	¼ mile west of Waverly Station	48	11764	7.30
23	Elliott Coal Co	Randolph	Elliott Station	48	11676	7.24
24	Buckhorn Coal Co	Lafayette	1 mile west of Waverly Station	48	11643	7.23
25	No. 10, Morris Coal Co.	Randolph	1 mile east of Huntsville	48	11642	7.23
26	No. 70, Kansas & Texas Coal Co	Macon	4¾ miles southwest of Excello	54	11626	7.22
27	Murlin Coal Co	Ray	Fleming Station	22	11583	7.19
28	Salt Fork Coal Co	Lafayette	½ mile east of Corder	22	11580	7.19
29	Jones & Davis	Randolph	3 miles west of Moberly	48	11574	7.19
30	Brush Creek Coal Co. Lower Vein	Jackson	3 miles southeast of Kansas City	24	11524	7.16
31	No. 1, Higbee	Lafayette	½ mile west of Higbee	44-48	11522	7.15
32	Labor Exchange	"	1¼ mile west of Wellington	18	11492	7.14
33	No. 1, J. C. McGrew	"	3½ miles west of Lexington	22	11395	7.08

I.—TABLE SHOWING CALFORIFIC VALUE OF MISSOURI COALS—Continued.

Rank	Name of mine.	County.	Location.	Thickness of vein in inches	Heat units per pound of coal	Pounds of water evaporated from and at 212° F. per lb. of coal. Boiler efficiency 60 per cent
34	Emporia	Putnam	1¼ mile north of Unionville	36	11390	7.07
35	No. 61, Kansas & Texas Coal Co	Macon	2 miles southwest of Bevier	51	11372	7.06
36	Richmond & Camden Coal Co.	Ray	1 mile west of Camden	20	11331	7.04
37	No. 11, Richmond & Camden Coal Co	''	1 mile west of Richmond	24	11322	7.03
38	No. 8, Mendota Coal Co	Putnam	½ mile south of Mendota Station	36	11274	7.00
	Missouri City Coal Co	Clay	Missouri City	22	11274	7.00
39	No. 14, Richmond & Camden Coal Co	Ray	¼ mile south of Richmond	24	11250	6.99
40	Corder Coal Co	Lafayette	¾ mile west of Corder	22	11233	6.98
41	Glen Oak, Lexington Coal Co	''	4 miles northeast of Lexington	24	11220	6.97
42	Valley mine, Lexington Coal Co	''	1½ mile south of Lexington	22	11209	6.96
43	Northwestern Coal Co	Macon	1 mile south of Bevier	42-48	11191	6.95
44	No. 2, Higbee	Lafayette	2 miles east of Higbee	42	11147	6.92
45	Dover Coal Co	''	1 mile east of Dover Station	18	11018	6.84
46	Rombauer	Adair	½ mile west of Novinger	43	10877	6.77
47	Carter	Lafayette	1½ mile east of Wellington	20	10770	6.69
48	Graddy-Lexington Coal Co	''	3 miles west of Lexington	20	10759	6.68
49	Grundy Coal Co	Grundy	½ mile southeast of Trenton	18	10704	6.65
50	J. B. Seitz	Lafayette	¾ mile west of Waterloo	18	10664	6.62
51	No. 2, Mendota Coal Co	Putnam	2 miles southeast of Mendota Station	34	10623	6.60
52	Mayview Coal Co	Lafayette	Near Mayview Station	18	10458	6.50
53	Blackbird	Putnam	3 miles northeast of Unionville	34	10437	6.48
54	Lingo	Macon	Opposite Lingo Station	36-42	10224	6.35

Table II shows the same coals according to their rank as in table I with their proximate analyses these proximate analyses were made according to accepted methods. All coals were analyzed and tested in duplicate. Since some of the coals showed the presence of gypsum, it was deemed best not to substract the sulphur found from the volatile matter and from the fixed carbon as is usually done.

The last column in table II shows how for the calorific value of a coal is dependent upon the amount of the volatile matter and fixed carbon. A study of this column will show that with few exceptions the sum of these two percentages seems to determine the rank of the coal, the same as the calorific value did in table I.

II.—TABLE OF PROXIMATE ANALYSES OF MISSOURI COALS.

Rank.......	Name of mine.	Water per cent.......	Volatile matter per cent.	Fixed carbon per cent.....	Ash per cent.	Sulphur per cent.......	Volatile matter plus carbon.........
1	No. 8 Western Coal Co.	2.35	35.73	53.72	8.20	4.10	89.45
2	No. 3 Weir Coal Co.	3.62	34.40	53.98	8.00	4.02	88.38
3	Brush Creek Coal Co.	10.30	40.04	45.35	4.31	2.35	85.39
4	No. 14 Central Coal Co. Upper Vein.	2.02	40.80	46.39	10.79	6.57	87.19
5	Rush Coal Co.	4.07	41.05	43.22	11.66	3.38	84.27
6	Keene.	6.17	40.83	45.04	7.96	3.72	85.87
7	Thompson.	8.95	34.75	51.28	5.03	1.11	86.03
8	Henry.	9.62	38.50	45.63	6.25	2.78	84.13
9	Cooper Creek Coal Co.	7.24	34.60	48.10	10.06	2.64	82.70
10	Kingston	10.63	38.58	44.03	6.76	2.54	82.61
11	Caldwell Coal Co	9.26	36.69	43.56	10.49	3.61	80.25
12	Bowen Bros.	6.65	40.27	40.68	12.40	4.67	80.95
13	Watkins	8.10	36.13	45.02	10.75	4.72	81.15
14	Excelsior.	10.25	36.10	44.69	8.96	3.54	80.79
15	Vernon Coal Co.	6.34	35.89	44.47	13.30	4.81	80.36
16	Marceline Coal Co.	9.45	33.25	47.27	10.03	5.73	81.52
17	Murlin Coal Co.	14.78	39.10	42.44	3.68	2.16	81.54
18	No. 15 Rich Hill Coal Co.	5.88	35.20	44.72	14.20	4.83	79.92
19	Edmonds.	9.55	35.23	46.42	8.80	3.15	81.65
20	No. 6 Farmers' Consolidated.	11.95	36.14	44.70	7.21	2.57	80.84
21	No. 66 Kansas & Texas Coal Co.	12.00	39.10	41.83	7.07	3.44	80.93
22	Silver Creek Coal Co.	8.34	37.68	41.34	12.64	5.28	79.02
23	Elliott Coal Co.	11.15	36.32	42.77	9.76	3.55	79.09
24	Buckhorn Coal Co.	8.58	38.20	42.04	11.18	4.90	80.24
25	No. 10 Morris Coal Co.	9.90	31.73	47.33	11.04	2.86	78.06
26	No. 70 Kansas & Texas Coal Co.	10.20	36.26	43.16	10.38	4.47	79.42
27	Murlin Coal Co.	13.07	37.85	41.66	7.42	1.92	79.51
28	Salt Fork Coal Co.	11.88	35.76	43.64	8.72	3.76	79.40
29	Jones & Davis.	11.05	36.87	41.65	10.43	6.56	78.52
30	Brush Creek Coal Co., Lower Vein	7.85	33.18	44.17	14.80	5.05	77.35
31	No. 1 Higbee.	10.00	29.99	50.77	9.24	3.57	80.76
32	Labor Exchange.	12 31	35.91	43.58	8.20	1.71	79.49
33	No. 1 J. C. McGrew.	15.02	34.20	43.20	7.58	2.97	77.40
34	Emporia	17.48	36.01	42.40	4.11	2.38	78.41
35	No. 61 Kansas & Texas Coal Co.	12.12	37.43	41.30	9.15	3.74	78.73
36	Richmond & Camden Coal Co.	9.83	37.93	42.99	9.25	3.11	80.92
37	No. 11 Richmond & Camden Coal Co.	11.97	36.36	41.65	10.02	4.26	78.01
38	No. 8 Mendota Coal Co.	17.29	37.19	41.43	4.09	2.66	78.62
	Mo. City Coal Co	12.45	34.48	42.44	10.63	2.95	76.92
39	No. 14 Richmond & Camden Coal Co.	10.20	36.75	41.20	11.85	5.87	77.95
40	Corder Coal Co.	9.90	35.08	43.05	11.97	4.78	78.13
41	Glen Oak, Lexington Coal Co.	14.39	35.00	44.58	6.03	2.01	79.58
42	Valley Mine, Lexington Coal Co.	13.75	35.30	42.40	8.55	2.22	77.70
43	Northwestern Coal Co.	11.00	31.77	45.74	11.49	4.28	77.51
44	No. 2 Higbee.	10.84	28.28	49.30	11.58	5.68	77.58
45	Dover Coal Co.	12.33	34.53	42.05	11.09	4.56	76.58
46	Rombauer.	12.12	30.10	44.20	13.58	3.52	74.30
47	Carter	11.56	32.93	42.10	13.41	3.50	75.03
48	Graddy, Lexington Coal Co.	12.33	31.55	42.64	13.48	3.94	74.19
49	Grundy Coal Co.	10.07	31.62	43.90	14.41	5.43	75.52
50	J. B. Seitz.	10.13	32.23	41.74	15.90	7.56	73.97
51	No. 2 Mendota Coal Co	17.59	34.11	39.85	8.45	3.21	73.96
52	Mayview Coal Co.	10.50	32.43	40.63	16.44	3.48	73.06
53	Blackbird	13.46	34.88	38.36	13.30	4.29	73.24
54	Lingo.	10.16	29.78	41.26	18.80	7.33	71.04

ACCIDENTS IN COAL MINES.

No other feature connected with the duties of the mine inspector proves so unpleasant as that of chronicling the list of names, together with the information leading to the cause and nature of the accident which has resulted either in the death or crippling for life some poor unfortunate miner. He who peruses the names of those who have fallen victims in the performance of their work and duties, and who have passed to the great beyond, will observe the names of many who were warm personal friends of the inspector, men with whom he has worked side by side in the mines for many years, and intimately associated with in and out of the mines—then when it must be that we are compelled to describe the harrowing details of a mine accident, sickening as they are often times, even when the victim is unknown—it is doubly severe when the unfortunate parties have been life-long friends.

Six of those who fell victims during the year were practical miners, having worked in the mines for 40 years and upwards. They were considered as men of good judgment and very careful, but a long experience and freedom from accident for so long a time, caused them at last to accept chances that cost them their lives and in several instances we might say at the very limit of their natural lives. The mines in the very nature of their surroundings will produce their annual crop of accidents, and as in some of the best regulated and managed mines, accidents do occur, just so with the most experienced miners, they too are gathered in along with the less experienced.

With a close observance of our mining laws as they now are on the part of mine operators and managers, and with practical, intelligent, energetic, careful and attentive underground foremen, we may reasonably expect a decrease in the number of mine accidents. But the casualties in the mines will never be brought down to the minimum, until our operators and mine managers realize the mistake of employing inexperienced and incompetent men to work in the mines. To put a man at work in a room who is totally unfamiliar with the nature and character of the roof in a coal mine, and who does not know when is the proper time to set a prop to make it secure, nor where or how to set a prop, is comparatively like leading cattle to a slaughter house, and such acts on the part of mine officials is nothing less than criminal in our estimation.

The wisdom of good laws for the prevention of accidents such as *we now have on our* statute books has been demonstrated in late years by the gradual diminution of fatalities in our mines; but the pernicious action of some of our mine officials during the year of employing inexperienced, incompetent and ignorant men to work in the mines offsets all the benefits derived from our mining laws and increases the number of accidents. During the period covered by this report the coal industry of our State was in a flourishing condition, with the demand for coal good and practical miners rather scarce. During such times mine officials were tempted to employ anyone that would call on them for employment, regardless of his qualification as a miner, and a large number of inexperienced, incompetent and ignorant men entered the mines during that time. This greatly swelled the list of mine accidents, a number of whom are now in their graves, and others maimed and crippled for life as the penalty paid for their unwise undertaking. Accidents in mines is one of the principle sources of anxiety to the mine inspector (especially fatal ones), and to prevent them as much as possible is the most important part of his official duty.

Whenever this office is notified that a fatal accident had occurred at any of the mines, I visit the scene of accident as soon as possible to make a careful investigation as to cause of same, attend the inquest when possible and examine witnesses with a view to reaching the exact cause of accident, and the particulars and details obtained of every accident will be found in an article written on Accidents by Counties in this report.

During the period covered by this report, or in other words from the 30th of June, 1900, to December 31st, 1901, there were a total of 49 accidents in our mines, of which 27 were fatal and 22 non-fatal; 12 of the fatal accidents and 6 of the non-fatal occurred between the 30th of June and December 31st in the year 1900, and 15 fatal accidents and 16 non-fatal occurred during the calendar year 1901. Of the 48 accidents occurring during the 18 months already mentioned Adair county is credited with 4 fatal and 4 non-fatal, followed by Barton with one fatal and one non-fatal, Bates one fatal and two non-fatal, Lafayette with one fatal, while Macon county is charged with 11 fatal and 12 non-fatal accidents, Randolph county is charged with two fatal and three non-fatal accidents, Ray with two fatal and Vernon county with a small output of coal is charged with 5 fatal accidents.

The above accidents were due to the following causes: From falling roof, 19 fatal and 7 non-fatal; from mine cars, 2 fatal and 6 non-fatal; from fall of coal, 1 fatal; from windy shot, 2 fatal; gas, 1 non-fatal; from premature blasts, 2 fatal and 4 non-fatal; from careless handling of powder, 4 non-fatal; from cage, one fatal. Out of the whole number of those injured in these accidents, 40 represented themselves as miners, 6 as number of the victims at peace in death, while around the camp you will readily be observed that falls of roof continue in this State as in all other mining states of the Union to be the most disastrous feature in the mining of coal.

It is noticeable also that more accidents happen in mines where the room and pillar system of mining is practiced than where the longway plan is used and more especially where the coal is blasted off the solid, as so many of those self-constituted miners are wholly unfamiliar with the use of powder, both in the matter of required amount for a charge or the preparation of a shot, and they recklessly charge a hole with double the amount of powder required and the shot when exploded hurls the coal in all directions, knocking out the props and shattering the roof to such an extent, that it takes the skill and ability of the most experienced miner to keep the place safe and secured with timber. The pernicious system of blasting the coal off of the solid, which was introduced in the mines of late years, has proved itself to be the most disastrous practice to the life and limb of the miner of anything yet introduced in the mines, and a trip to a mining town or camp where the method is practiced will convince the most skeptical. In the grave yard you will find a large number of the victims at peace in death, while around th ecamp you will find a large number of the cripples with broken limbs and backs who have to worry through life dependent upon relatives and others for charity.

That dangerous system has also filled our mines with a very low grade of miners, a large number of whom do not know the first principle of coal mining and it would be more appropriate to call them coal butchers than coal miners, as they not only place their own lives in jeopardy but endanger the life of others. All who are interested and will take pains in reading this article on accidents, may, by examining the respective causes of each accident as embodied in this report, be convinced that a large majority of those occurring last year are due to carelessness.

The mines of this State are as well provided for in all things necessary to prevent accidents as will be found in any mining state in the country. Our operators generally furnish everything that is needed for the mine to keep it in good condition. Miners are provided with plenty of props, which are delivered to them in their working place and in sufficient number when called for, to enable them to protect themselves, and I believe that mine accidents can be greatly reduced if the miners themselves would exercise more care and better judgment. I would also recommend that mine foremen be more vigilant in their official duties and visit the working places of those under their care oftener. I think it is the duty of every mine foreman to visit each working place every day and look carefully after the safety of every employe. The following letter written by Mr. W. E. Murlin, president of the Murlin Coal Co., to all his mine foremen and agents is self-explanatory and very commendable. It fully expresses my sentiments, and meets with my approval, and hope all other mine officials will emulate him:

Murlin Coal Co., Bevier, Mo., Nov. 8, 1901.

To all Foremen and Agents:

Your attention is again invited to the necessity of constantly looking after the welfare and safety of employes in and around mines. Roadmen and trackmen should daily inspect all entries and traveling-ways, and see that same are in a safe condition. Rooms and working places must be examined frequently to see that miners are using proper care in keeping their working place in a safe condition.

Ropes, cages and hoisting apparatus must be examined daily by engineers and yourself, to see that same is in perfectly safe condition and repair for handling of men on cages.

No risks involving safety of life and limb of employes must be assumed.

Full and complete compliance of this order is imperative. Yours truly,

W. E. MURLIN,
President.

Carbon J. P. Davis,
J. P. Sneed,
Harry Wyatt,
H. L. McPherson,
W. A. Atteberry,
H. H. Wayland.

While Mr. Murlin is only addressing and instructing those in his employ, the inspector will take advantage of his commendable and timely instructions and with his permission, go further and invite every mine official in the State to read the above instructions carefully, and then comply fully with every word therein, because it is applicable to any and every man in the State under whose care the safety of men in our mines depend. The Murlin Coal Co. shows a good record against accidents since its been in business, and the vigilance displayed by the underground management accounts for its record.

FATAL ACCIDENTS BY COUNTIES.

ADAIR COUNTY.

Thos. Mitchell, a miner employed by the American Fuel Company at Stahl, was instantly killed by a fall of rock on the 3rd day of August, 1900. Deceased and another man were working in an entry which had just been turned off and deceased was in the act of loading a car when the rock fell between the car and the face of the entry and caught him under it, crushing his life out at once. He was 19 years old and single. An inquest was held and the jury returned a verdict that the deceased came to his death by an accident caused by a fall of rock, said fall caused by an oversight of the deceased in not propping the place, thinking it was safe at the time.

William Little, a miner, employed by C. B. Havens & Co., at mine No. 1, near Danforth, was killed on the 27th of August, 1900, by a fall from the roof. Deceased was a boy about 15 years of age and was working with his father when the accident happened. Shortly after the accident I visited the mine and made an investigation and discovered that a slip was running at an angle across the room, but the roof was strong and could easily have been made secure by promptly setting two props. Sad as it is to reflect upon, no one knew better or realized the situation better than the father of this boy, who, as is too often the case, delayed too long. The rock fell on the boy, crushing the life out of him at that tender age when he and all other of his age should be in school. We understood that the coroner of Adair county held an inquest over the body, but we failed to obtain a copy of verdict of the jury.

Lowery Robb, a miner, working for the Rombauer Coal Co., at mine No. 1, near Novinger, was killed by a premature shot on the 9th of January, 1901. Deceased was working in a room with his father, and prepared a shot in the forenoon which was to be lighted with fuse at the noon hour. From all the information we could gather of the accident (which we considered very strange) goes to show that the man working in the room on the inside also had a shot ready to fire at the same time, and as it was known to Robb that the shot in the next room was in the pillar, he went out on the entry until that shot went off, when he went back to his room to light the fuse, but before he reached the face the shot went off and killed him instantly. On investigation it was discovered that the shot on the inside room had blown through the pillar and the fire from the powder ignited the fuse. The boy was but 17 years of age. He had worked several years in the mines. The verdict brought by jury after an inquest being held was accidental death.

Evan Jones, a miner, employed by the Rombauer Coal Co., was fatally injured at mine No. 1, near Novinger, by a fall from the roof on the 17th of June, 1901, and died at noon on the 19th. Deceased had a standing shot which stood over Sunday, and on Monday morning he went to his room and started to work it off, when a piece of slate fell, caught him under it and crushed his pelvis, or lower part of the abdomen, injuring him so badly that he died from his injuries two days later. He was about 54 years of age and single. Mr. Jones was a practical miner, having worked the greater portion of his life in the mines. He was well known to the writer and we considered him a very careful man. No inquest held.

BATES COUNTY.

Louis Mutrix, a miner employed by the Rich Hill Coal Co., at mine No. 15, was instantly killed on the 10th of September, 1900, by a fall of slate at the face of his room. Deceased was working alone and undermining off a standing shot, when a piece of slate fell and caught him. He was found by the driver an hour or so afterward under the slate and cold in death. He was 35 years old and single. The coroner's jury rendered a verdict of an accidental death by falling of slate at the face of his room.

BARTON COUNTY.

Chas. Karlson, a miner, employed by the Wear Coal & Coke Co., at mine No. 10, near Minden Mines, was instantly killed on the 25th of July, 1901, by a premature blast. Karlson was working in an air-course and at noon he fired two shots, one of which went off immediately and after waiting 30 seconds for the other to fire he went back on the shot, thinking that it failed to light, and when up to the shot it exploded, hurled the coal around, killing him instantly. Deceased was 30 years of age and single. No inquest held.

LAFAYETTE COUNTY.

Peter Buethens, a miner, employed by the Lexington Coal Co., at the Glen Oak mine, near Lexington, was instantly killed on the 24th of October, 1900, by being caught between cage and shaft curling. At 5 p. m. on above date the men crowded on the cage, overloading it, 9 being on when only 8 were allowed to ride, and the cager, whose duty in was to see that only 8 got on the cage and who also attended to the signals, ordered one off, but failing in his efforts to get one off he started to put a car of coal on, thus denying them the opportunity of going up then, and at this moment they began stepping off, when the cage was started up on signal given to the engineer by the regular topman, who insists that he received a signal from below, but the bulk of evidence received at the coroner's inquest is against him The deaceased (Mr. Buethens) was in the act of stepping off when the cage started and was caught between the cage and bottom of curbing. breaking his neck and killing him on the instant. Deceased was 63 years old, a widower, and had 5 grown and married daughters.

Verdict of the jury was in accordance with the above.

MACON COUNTY.

Charles A. Sparkman, employed by the Kansas & Texas Coal Co., at mine No. 70, near Ardmore, was instantly killed by a fall of rock on the 11th of September, 1900. On my examination of the place shortly after the accident, was informed that deceased was on his knees fileing and sharpening the bit of his drill, when a bell rock weighing fully two tons fell and crushed the life out of him in an instant. The rock fell between the end of the track and his working face. On inquiry I was informed that deceased was not a miner, and had only worked a few weeks in the mine. At the time of this accident and for some months previous to that the miners of this company were on a strike, and Sparkman was employed by the company for several months to go around and employ men for the company to take the place of the striking miners, and when the company secured enough of men to operate their mines, and his services no longer needed in that capacity, they employed him as a miner, when he was not one; hence the result was loosing his life. Deceased was a citizen of Randolph, and had lived many years in that county. He was 30 years of age, married, and had 4 children. No inquest held.

William Frost, a driver, employed by the Kansas and Texas Coal Co., at mine No. 61, near Keota, was killed by a piece of slate on the 22nd of January, 1901. Deceased was going in with a trip of empties when a piece of slate fell from the side of the entry as it passed the corner of an old cross entry, striking him on the head and sides, causing immediate death. The entry at that place was high and the sides had fallen straight, and some of the coal came off at the same time as the slate that fell. Deceased was 21 years of age, and single. Coroner viewed body, took some evidence, but held no inquest.

John Red (colored), a miner, employed by the Kansas & Texas Coal Co., at mine No. 61, near Keota, was killed by a fall of roof April 2nd, 1901. Deceased was working alone, and was found dead under a large piece of the roof near his working face, and to all appearance had been dead for some time, as the body was cold. He was 35 years of age, married and had two children.

Coroner viewed the body, took testimony without jury, and considered the evidence so plain that he considered a jury unnecessary, and he found that the accident was caused by the deceased not properly propping his room, when he had plenty of props in the place to do it.

Wm. H. Haley, a miner, employed by the Kansas & Texas Coal Co., at mine No. 66, near Keota, was instantly killed by a fall of the roof on the 29th of April, 1901. I visited the mine a few days after the accident, and on investigation learned that deceased was loading a car of coal under this piece of roof which was known to be dangerous; his own Buttie had warned him of the danger and advised him to secure himself by setting props under it, but to no purpose. The piece that fell on the injured man was about a foot thick and the setting of two props on the roadside would have made the place perfectly safe, but he did not heed advice and suffered death thereby. This accident happened early on Monday morning, and we reached the mine a few days later, and while making an investigation was informed that deceased and his wife, in company with some neighbors, visited the mine the Sunday before the accident occurred, and while the party were in the mine they visited Haley's room, and his own wife, who was never inside of a mine before, noticed the dangerous condition of the roof and cautioned her husband to prop it Monday morning before he went under, and still he paid no attention to the warning. The injured man was not a practical miner and only worked a few months in the mines, being employed by this company, like nearly all of their employes, during the strike. He was 30 years of age, married, and had two children. Coroner after viewing the body and hearing some evidence considered a jury unnecessary, and pronounced it accidental, caused by not propping up the room.

Antonio Oberto, a miner, employed by the Kansas and Texas Coal Co., at mine No. 61, near Keota, was fatally injured by a fall of coal on the 17th of July, 1901. Deceased was working under some top coal at the face of his room, when it fell and caught him, injuring him so badly that he died six hours later. The injured man was 43 years of age, married and had three children. The coroner after viewing the body, took testimony of several witnesses and considered jury unnecessary and rendered his verdict—"that deceased came to his death accidentally by neglecting to secure his top coal.

Geo. Stewart (colored), a miner, employed by the Kansas & Texas Coal Company, at mine No. 61, near Keota, was fatally injured by a fall of rock on the 15th of October, 1901. Deceased was at work drawing back-pillars alone, and while mining off a shot he was caught by a piece of slate falling on him and was held under it until the driver came after his car and released him. He was so severely injured that he died in a few hours after taking him home. Visiting the mine a few days later I was informed that the driver had warned him of the dangerous character of the roof, but not being a practical miner, paid no heed to the warning and paid the penalty of his ignorance with his life. Deceased was 28 years of age and married, but had no children. Coroner's verdict: Accidental, caused by his own neglect.

Sebastian Targetta, a miner, employed by the Kansas & Texas Coal Co., at mine No. 61, near Keota, was seriously injured by a fall of the roof on the 31st of October, 1901, from the effects of which he died some time later. The injured man was working off some coal at the face of his room when some slate fell off the roof on his back. The doctors pronounced his back broken. After being taken home he suffered a great deal, and while we didn't think he could possibly get well, we failed to learn how long he lived after the accident. He was about 30 years of age and single.

Ura Kirtley, a driver, employed by the Kansas and Texas Coal Co., at mine No. 70, near Ardmore, was fatally injured November 14, 1901, by a car of coal. From information obtained after a thorough investigation of the cause of the accident we found that Kirtley was riding on the tail chain coming out with a trip of coal, and from some unknown cause fell under the front car and when found the car was off the track and the two front wheels had passed over him. His pit cap and lamp were found about 10 feet from where the car stopped, indicating that he fell where they were found and was dragged the balance of the distance and until the wheels climbed his body and threw the car off, causing the mule to stop. We learned that the mule was an old-timer well-broken pit mule, and the track where the accident occurred was newly laid with heavy iron and was in first class condition. The theory of those most familiar with the circumstances is, that Kirtley was riding on the tail chain, and as the car started to go down grade the mule quit pulling, causing the chain to slack and he slipped off, thus loosing his balance and went under the car. Deceased was 35 years of age, married and had one child. He lived about 24 hours after the accident. No inquest held.

Peter Daniels, a miner, employed by the Northwestern Coal Co., at mine No. 4, Bevier, was killed by a fall of rock on the 14th of August, 1900. Mr. Daniels and son were working together and were engaged in drawing entry pillars on one entry, and the Griffiths brothers were engaged in same kind of work on the other entry, and both parties working *on the same* pillar or stump and from 15 to 20 feet apart. The evidence taken at the coroner's inquest showed that the coal behind them had been taken out and that they were moving or coming with the work towards the shaft bottom. On the day of the accident and about 3 o'clock in the afternoon the deceased was on his knees undermining when all of a sudden and without giving a partical of sign or warning a large pile of rock and slate fell on him, crushing his body in a fearful manner, breaking his legs and arms, killing him instantly. His son was loading a car of coal when the rock fell on his father about 10 or 15 feet away. The rock fell across the pillar and within a few feet of the Griffiths brothers, who had a very narrow escape from death themselves, and as soon as they realized the situation they ran at once to the assistance of Mr. Daniels, but when the two Griffiths boys reached the place and saw the situation they were practically helpless without getting more help, as there was so much opening behind them where the pillars had been taken out that the roof fell so high that it took all the men in the mine about two hours to get the deceased from under the fall.

Mr. Daniels was one of the most practical miners in the State; had worked in the mines for 45 years, 16 years of which he worked at this mine where he finally met his death. He had been hurt twice in the mines before and was so crippled in his limbs that he could not stand on his feet to work and had to work on his knees all the time. He was a good man and lived up to his profession, had given his heart to God in his infancy, had kept the faith through all the turmoil, tribulation, temptation and trials of even the life of a coal miner. Mr. Daniels clung to the cross and died as he lived a devoted Christian, he was loved and respected by all that know him, and by none more so than the writer, who knew him for many years and respected him greatly for his high standing as a citizen and a Christian. Deceased was 57 years of age. Married, and had one son.

The jury, after hearing all the evidence concerning the accident, rendered the following verdict: We, the jury, being duly sworn, find from the evidence that Peter Daniels came to his death at or about the hour of 3:00 p. m., Tuesday, August 14, 1900, in the Northwestern Coal Company's mine No. 4. We further find that his death was an unavoidable accident, due to the carelessness or negligence of no one.

(Signed) ARTHUR C. JONES,
D. F. BURRIS,
ARTHUR ROBERTS,
G. W. SHONK,
A. E. FARRELL,
ED. ANDERSON,
G. E. SCRUTCHFIELD, Coroner.

William Feidler, a miner, employed by the Northwestern Coal Co., at mine No. 8, near Bevier, was killed by a fall of rock on the 16th of August, 1900. Deceased and his son were working together in a room, and while Mr. Feidler was engaged in loading a car of coal a large rock fell and caught him between the car and rock, killing him instantly. I visited the mine shortly after the accident and on investigation found that the room was well propped and everything about it was done in good workmanlike manner. The room had not been disturbed since the accident aside from taking out the body. I noticed the rock that fell had thin edges all around and thick in the center, and being over the wheelroad, could not be secured by props, and it was too low to set cross bars, leaving no safe remedy but to take it down. We also noticed that the rock when it fell discharged two props on the roadside. The car that deceased was loading at the time was standing at the end of the track about 6 feet from the face and was about half loaded, and the rock was laying crossways over the car. The rock was about 9 feet long, 5 feet wide and a foot thick in the center and tapering down along the edges.

The testimony taken at the inquest proved that there was plenty of props in the room and that the son of the injured man had told his father not to load coal under the rock, as it was loose, but the unfortunate man did not heed the warning of his son. The deceased was a practical miner, having worked in mines for 45 years or more, had worked in the mines of Bevier since the year 1884. He was a sober, industrious, a worthy man, esteemed and respected by all who knew him. He was 58 years of age, married and had 7 children, 3 sons and 4 daughters, 5 of whom are grown up and married, the other two are nearly grown and are at home. A large number of witnesses were examined at the inquest, and the jury returned the following verdict:

We, the jury, being duly sworn, find from the evidence that William Feiddler came to his death at about the hour 9:00 a. m. on Thursday, August 16th, 1900, at mine No. 8 of the Northwestern Coal & Mining Company.

We further state that his death was due to the falling of an overhead rock, it being a case of accident due to his own carelessness.

We, the jury, have personally examined the place of accident, and all concur in the above statement.

(Signed) J. W. OVERBY,
HENRY RUECKER,
J. W. BURGIN,
JOHN WACHTER,
ROBERT N. JONES,
ROBERT RUECKER,
G. E. SCRUTCHFIELD, Coroner.

Peter Dorr, a driver, employed by the Northwestern Coal Co., at mine No. 8, near Bevier, was killed by a fall of rock and timber on the 14th of October, 1901. Deceased took in a trip of two empty cars about 9 o'clock the morning of the accident, and not returning promptly with his trip, the boss driver followed him in to ascertain what was the cause of delay and found him dead in front of the first car, with an entry cross-bar and other timber with a fall of rock on top of the timber laying across his neck. He was driving in the first east entry on the north side, and distant about 1,000 feet on the main north going in with his trip, and as he passed an abandoned room, with the switch still down, the wheels of the front car struck the points of the switch, which caused the car to jump the track knocking out a leg (or a post) of the room frame, which in turn let down the cross-bar, laggins and rock, all of which fell on the driver, killing him on the spot. I visited the mine shortly after the accident and on examination discovered that the driver must have been going at a reckless gait to knock and force out the timber as he did. Deceased was 18 years of age and single. Coroner's verdict was not returned at the time the company reported accident to this office.

RANDOLPH COUNTY.

Thos. Bain, foreman, employed by the Higbee Coal Co., near Higbee, was killed by a fall of slate on the 29th of October, 1900.

The mine was newly sunk, and only three men were at work at the bottom taking off coal to make a double parting. The entries were only about 10 feet from shaft timber when accident occurred, the cages were not even put in at that date. The bottom had been standing idle over Saturday and Sunday on account of rain, and at 7 o'clock Monday morning 3 men went down, but before they commenced work they sounded the roof and found it dangerous, and called on Mr. Bain to come down to advise them as to the best way to make it safe and secure. Mr. Bain at once went down in the bucket, got off at the bottom, took hold of a pick to sound the roof, and found it loose, he called for the measuring stick and as one of the men handed him the stick they heard a crack and called on him to jump off which he tried to do, but too late; the slate came down, caught him and crushed out his life in an instant. It was not over 5 minutes from the time he stepped out of the bucket until he was a corpse. I was informed on investigation that the 3 men at the bottom told him as he stepped off the bucket that the roof was loose and for him not to go under it. Deceased was one of the most practical miners in the country, he had spent 60 years of his life in the mines in various positions, and was versed in mines and mining in every detail, and occupied a high standing among miners and operators. He was an industrious and worthy man, esteemed, loved and respected by all who know him, and by no one more than by the writer, as he was one of my best friends, having associated together for a great number of years and it pains me to have to chronicle these few remarks of his untimely and sudden death, but his memory will always be pleasant to me. He was 68 years of age, married, and had 5 grown children.

The coroner examined some witnesses and after he heard their testimony, did not consider it necessary to hold an inquest and pronounced it accidental.

Miller Williams (colored), a miner, employed by the Murlin Coal Company, at mine No. 5, Kimberly, was fatally injured on the 20th of September, 1901, by a fall of rock. Deceased was shoveling coal at the face of his room, when a large rock fell on him. The accident happened about half past nine o'clock in the morning and he died at 6 p. m. same day. I examined the room a few days after the accident and found the rock there as it fell, it was about 8 feet long, 3 feet wide and about a foot thick and could have been secured by properly proping, but on examination I discovered that the working of the room had been carelessly and recklessly performed, there were but very few props set, and those that were set was put up in bad shape. Deceased was married, but we failed to learn his age or if he had any children. No inquest held.

RAY COUNTY.

John Zucklin, a miner, employed by the Richmond and Camden Coal Company at mine No. 4, near Richmond, was fatally injured on the 18th of October, 1900. Deceased had finished his day's work and started to go out to the shaft bottom, and when he came to the road head he discovered that the mule was there with his trip of full cars coupled and ready to start for the bottom of the shaft. Zucklin climbed on top of one of the cars to ride out instead of walking, which habit was customary with the miners, as the entry was long, low and wet in places, and while riding out thus he noticed a chunk of coal on the car in front of him about to fall off and he reached forward to adjust it and before he could recover his position on the car on which he was sitting, his head came in contact with a low place in the rock roof, forcing his body back on the loaded car, causing such an injury of the spinal cord that he died about 4 o'clock the next morning. Deceased was a practical miner, having worked in the mines of Ray county since the year 1888. He was sober, honest, industrious, good citizen and esteemed by all that knew him, he had made a great many plans for the future, had purchased a nice home and was striving hard to pay for it, when death took him away from his beloved wife, his seven dear children and his aged mother, who was making her home with this gentle, kind and affectionate son, who was taken away so suddenly. Deceased was about 38 years of age, married, and had 7 children, 5 girls and two boys, the oldest but 13 years old and the youngest less than one.

William Swope, a miner, was instantly killed by a fall of rock at a mine operated by Charles Ottman, and the deceased, on the 10th of November, 1900, near Richmond. Deceased entered the mine as usual morning and while undermining, a large pile of rock fell and caught him, breaking his limbs and mashing his body in such a manner that death resulted before he could be rescued, as no one was in the mine at the time, it being a local mine and only employed two or three men. Deceased was about 40 years old and single.

VERNON COUNTY.

Paul Martin, a miner, employed by the Central Coal and Coke Co., at mine No. 14, near Panama, was killed by a fall of slate on the 13th of August, 1900. Deceased was engaged in drawing pillars and was working alone. On the day of the accident he was at his working face in the act of drilling a hole when a piece of slate weighing about 3 tons fell and caught him, crushing out his life in an instant.

The accident was not known to any one until he was missed from the dinner circle by his fellow miners, when a search was instituted, which resulted in finding the body mutilated and cold in death. No one knows how long he had been dead as nobody heard or knew anything about the fall. Deceased was a practical miner, had been working around the mines of Rich Hill for about 14 years, was sober, industrious, of good moral character and a good citizen. He was 55 years of age, married, and had 3 grown children. The coroner's verdict was—unavoidable accident.

Abe Brown (colored), a miner, employed by the Central Coal and Coke Co., at mine No. 14, near Panama, was killed by a fall of slate on the 20th of December, 1900. Deceased was loading a car of coal in his room when a piece of slate weighing about a ton fell on him while he was bending over building coal on his car, crushed him and killed him at once. Deceased was 35 years of age, married, and left 5 children.

Thos. Latcham, employed by the Central Coal and Coke Co. as shot firer, at mine No. 14, was killed at said mine on the 21st of January, 1901, by an explosion. Full particulars of this will be found on next page under the head of eplosion. Latcham was 32 years of age, married, and left 4 children. The coroner brought in the verdict that deceased "came to *his death by asphyxiation.*"

R. D. Williams, also a shot firer, employed by the same company and at the same mine as Latcham, was killed in the same explosion. A detailed account and a full description of the explosion is given in an article written on the explosion and published in this report. Deceased was 29 years of age and single.

Lawson Glenn, a miner, working for the Arthur Coal Mining Company, near Panama, was killed on the night of the 11th of July, 1901, by a fall of slate. Deceased was working in an entry on the night shift and was on his knees making a cutting when about 4 tons of slate fell from the roof on his head and killed him instantly. The slate that fell was about 8 feet long, from 4 to 5 feet wide, 2 foot thick at the thickest place and tapering down to a feather edge. The accident was caused by a slip running along the side, giving the slate a loose end, and being over the wheel road could not be secured except by cross-bars. The other man that worked with him escaped unhurt. Deceased was 25 years of age, married, but had no children.

EXPLOSION AT MINE NO. 14.

On the 21st day of January, 1901, at 7 p. m., an explosion occurred at mine No. 14, owned and operated by the Central Coal and Coke Company, a company that operates a large number of mines in Missouri, Kansas, Arkansas and Indian Territory, with general office at Kansas City. At 4 o'clock on the day of the accident after the miners had finished their day's work and retired from the mine, Thos. Latcham and Rees Williams, the two shot firers, repaired to the bottom of the shaft, and immediately entered upon their duties of firing the shots prepared by the miners during the day. The two shot firers were together and commenced firing at the south entry on the last of the air and worked against the current; they had fired all the shots prepared on the south entry and on entry M and had fired all on entry L up to room 9, in which room we came to the conclusion, after a thorough examination, caused the explosion. At about 7 o'clock in the evening a dull explosion was heard by the miners living in close proximity to the mine and they at once recognized that something unusual and serious had occurred below. A large number of miners at once collected at the pit top ready and willing to enter the mine and render any assistance in their power to rescue their fellow miners, and as soon as it was deemed even comparatively safe a rescuing party entered the mine, composed of the most practical and skillful miners, headed by Mr. John Williams, the mine foreman, and a brother to one of the shot firers. The rescuing party had not proceeded very far before *they discovered* that an explosion had occurred, and found a stopping had been blown out between the intake and the return, close to the shaft bottom, which they stopped up by a canvass before proceeding further, in order to get the air around. On going further into the mine they discovered a door had been wrecked which destroyed the ventilation at that point and in its place a canvass door was provided in order to assist their further progress into the mine to look for the men; but the rescuing party, all of them practical miners and led by one of the most practical mine men in the State, realized that great precaution had to be exercised in the search, as the ventilation had been destroyed by the wreck of doors and stoppings and the mine was full of powder smoke, sulphur, fumes from the explosion of so many shots, after-damp and dust from the windy shots, the search was made with safety lamps. On proceeding further they came across the body of Williams, on the outside of room No. 1 on entry "L," and Latcham at room No. 2, about 75 feet beyond, both men were dead. At the time the accident occurred I was in another part of the State and was notified of the explosion on the morning of the 22nd and reached the scene of the accident on the morning of the 23rd, and proceeded at once to make a thorough and careful investigation as to the cause and of the damage done by the explosion.

Shaft No. 14 is located about a mile south of Panama, and equipped with first class machinery, the ventilation is furnished by a 15-foot ventilating fan, and the ventilative current divided in 3 separate and distinct currents and very practically conducted around every part of the mine. The shaft was sunk about two years previous to the time of the accident, and at the time the explosion occurred, there were about 150 men employed and the mine furnished about 700 tons of coal per day. On entering the mine to make this examination I noticed the same conditions existed therein as that immediately after the explosion occurred, nothing having been done besides taking out the dead bodies of the two shot firers. I was ably assisted in the examination by four of the most practical miners and by Mr. Williams, the mine foreman, and Mr. David Mackie, general manager of all the mines of the Central coal and Coke Co., the latter being one of the most practical mine managers in the country, having spent about 60 years of his life in the mines, and is familiar with mines and mining in all its details from a practical standpoint. On beginning our examination of the mine, we discovered the extent of the explosion was very limited, and outside the wrecking of one door and the blowing out of a few stoppings the mine had suffered no other damage and could be operated the next day with the usual force of men. We made a thorough search for the seat of the trouble, and after the most careful investigation we could not avoid the conclusion, judging from the effects produced by the shots fired, that the trouble oriignated in room No. 9 in the entry "L." Here we found that two shots had been fired, one of which had been indifferently prepared and evidently greatly overcharged with powder, as it blew off the heel, leaving fully 4 feet of the hole behind. What we term a blow-out shot; this shot having created and discharged a large amount of carbonic oxide gas, this gas made the conditions ripe for trouble; immediately follows the shot on the other side of the room, and it being greatly overcharged with powder, with the result that when it was exploded, it threw out a great sheet of fire and flame at the same time hurling with great force the liberated coal to the rib on the other side of the room and clear out to the mouth of that room —this proved to be windy shot. There was nothing to prevent the flame from the windy shot coming in contact with the oxide gas born of the blow-out shot, and that the two did come in contact explains the explosion and the cause of that concussion which worked the damage done.

We also discovered that a very careless, illy-prepared and overcharged shot was fired in room No. 8, but we found sufficient proof to justify us, in the conclusion, that the starting point of the explosion originated in room No. 9. The two shot-firers, after firing the shots at the last-mentioned room, appear to have gone together to room No. 2, on entry "L," where Latchman was later found by the rescuing party, and the indications all showed that he had died instantly by the force of the concussion. He was lying on his face with his torchlight and knife by his side. The tracks of Williams showed that he made a hard struggle for his life, as he left Latchman and crawled on his hands and knees towards the shaft bottom, aiming to get to the fresh air, but the ventilation had been so deranged by the wrecking of doors and stoppings that when he met the bad air engendered by the explosion, it so overcome him that he fell in his gallant effort and died about 75 feet from his comrade, and was the first found by the rescuing party laying on his face cold in death. There were no burns or bruises on either one of the men or any marks whatever, and their death was evidently caused by asphyxiation. The two shot-firers were practical miners and had worked in the mines of Rich Hill for a number of years; had worked together as shot-firers at the mines of this company for the last four years before the accident and were considered the most reliable shot-firers in Rich Hill. Both were sober, careful, and always displayed good judgment in the execution of their dangerous duties. Entering the mine at 4 p. m. on this fatal day, with about half of the shots fired at 7 p. m., when the explosion took place, showed that they exercised great precaution and took plenty of time between shots, and after a careful investigation of every feature connected with the explosion, I exhonerate the shot-firers from any blame.

The mine is practically operated and well ventilated, and there is nothing left undone here to procure the greatest safety for the employes. Mr. Williams, the foreman of the mine, is one of the most practical men of the State. He is sober, careful and very attentive. On all of my visits to the mine I find Williams at his post of duty carefully guarding the interest and safety of both the men and the company. He keenly felt the sadness of this accident, his beloved brother being one of the victims. After a careful and painstaking investigation of the mine, and due consideration given all the evidence taken at the inquest concerning the accident, I find nothing calling for censure of the Central Coal & Coke Co., or its officers, for any failure to comply with the mining law or any neglect of duty. In my judgment, the explosion was due solely to the indifferent and illy-prepared shots fired in room No. 9 on entry "L."

After this investigation a consultation was held between the mine officials and the coal mine inspector, with the aim and purpose of devising some means by which greater security would be afforded shot-firers. After an exchange of views, a plan was suggested and at once adopted by Mr. Mackie, who, calling up his foreman, instructed him to at once put another man on the shot-firing force, directing that this extra man should charge and tamp all holes, and in the event of a hole being found that was drilled too far into the fast, not to charge it, and to use his own judgment in charging any hole. In this way shot-firers have a knowledge of the nature and character of all holes drilled before firing them. This will add greatly to the security of the shot-firer and has my very decided approval.

NON-FATAL ACCIDENTS.

ADAIR COUNTY.

February 23, 1901, Oriso Alexandro was seriously injured by the premature explosion of a shot at a mine of the C. B. Haven Coal Co. at Danforth. The injured man, after he lighted the shot, retired, but before he was out of the way it exploded, injuring him very seriously, but will not result in permanent disability.

March 16, 1901, Mansfield Taylor was seriously injured in his room by the explosion of a shot at mine No. 1 of the C. B. Havens & Co. There were two other miners with Taylor in the room at the time, and both were slightly injured, but all will soon get well.

March 21, 1901, George Collville was injured by a fall of coal at mine No. 1 of the American Fuel Co. at Stahl. Collville was using a pick, trailing the soft clay which had been standing, when the coal fell without warning. It knocked him down and the coal breaking his collar bone and otherwise injuring him, and but for some loose coal laying by his side, which took the weight of the fall, the accident undoubtedly would have resulted fatally.

December 16, 1901, Neil Maloney was injured by a fall of slate at mine No. 1 of the C. B. Havens & Co. Maloney had fired a reckless shot at the noon firing, which knocked out several props, and he neglected to reset them before starting to work, when the slate fell, bruising him on the back and cutting his eye. Accident is not serious.

BATES COUNTY.

August 22, 1900, Tony Jetto was injured by gas at mine No. 15 of the Rich Hill Coal and Mining Co. Jetto was drawing pillars on the eigth east entry. At the time of the accident he was drawing the pillar of room No. 37 and broke through into room No. 38, which had long been abandoned and caved in. Jetto struck his head and lamp up to a hole above the fall and ignited some standing gas lodging there, burning his face and hands badly, but not dangerously.

September 29, 1900, John Johnson was injured by an empty car at mine No. 15 of the Rich Hill Coal Co, Johnson was a boy, about 16 years of age, at the time of this accident. He got into an empty car to ride to his work and the train ran away, upsetting the car on him and dragging the car about 150 feet with the boy under it, breaking his arm, collar bone and bruising his body all over.

BARTON COUNTY.

July 1, 1900, Wm. Hostler was injured by a trip of cars at mine No. 3, Wear Coal Co., at Vernon. Hostler had been repairing the track on the east side of the mine, and hearing a driver coming in with his trip, he tried to step out of the way, but made a misstep and fell under the cars, bruising his legs and wrenching his back, which laid him up. At the time he was supposed to be fatally injured, but he got well and went to work.

MACON COUNTY.

July 28, 1900, W. H. Warner was injured by a trip of coal at mine No. 66, operated by the Kansas & Texas Coal Co. at Keota. Warner was employed as a driver, and was coming out with a trip of coal and, forgetting to open a trap door which he had to go through, drove his trip into it and broke his arm.

August 9, 1900, Lysander Waddell was injured by a fall of rock at mine No. 70, operated by the Kansas & Texas Coal Co. near Ardmore. Waddell had fired a shot in turning a room which kicked back on rib, loosening rock over the wheel road in the air course, the rock fell on him while he was preparing to secure it, crushing his ankle and breaking two bones of his leg close to ankle joint, and bruised him considerably on body, side and back.

January 7, 1901, Thos. Downs was injured by a coal car at mine No. 66, operated by the Kansas & Texas Coal Co. Downs was a driver at said mine, and in coming out of a room with a full car of coal in attempting to step on the tail chain, his foot slipped, he fell between the car and rib and bruised his chest and shoulder, but the injury was slight.

February 1, 1901, Vinarilla Silvis was injured by the explosion of powder at mine No. 61, Kansas and Texas Coal Co. Silvis was doing some work at his tool hoe, and in adjusting his light a spark flew off his lamp and into the box, igniting some loose powder in the bottom, and exploded a part of a keg of powder close by, burning him very seriously on the head, arms and shouders.

February 7, 1901, Fritz Starchirs was injured by a mule at mine No. 66, Kansas & Texas Coal Co. Fritz was a driver, and in coming out with his trip he was riding on the tail chain, when the mule suddenly commenced kicking, cutting him badly about the face and mouth.

March 15, 1901, Walter Graham was injured by a fall of rock at mine No. 61, Kansas & Texas Coal Co. Graham was at work in his room loading a car of coal, and while in the act of shoveling, a piece of rock roof fell on him, breaking his leg and cutting him on the head, arm and side.

April 19, 1901, Marvin Belsher was injured by the explosion of a keg of powder at mine No. 57, Kansas & Texas Coal Co. Belsher while opening a keg of powder was badly burned about the face and hands by the explosion of the powder, which ignited from a spark off Belsher's pit lamp, and while his injuries will not necessarily prove fatal, it will take him a long time to get well, and the probabilities are that he will be crippled with his hands for life.

August 14, 1901, Richard Woodfin was injured by a fall of roof rock at mine No. 61, Kansas & Texas Coal Co. Woodfin was a driver at said mine, and when near the shaft bottom, coming out with his loaded trip, the switch was blockaded and he had to stop, and while waiting a piece of the roof fell on him and slightly bruised his back and side, the coal car took most of the weight, thus saving him from a more serious injury.

August 23, 1901, Aubrey Price was injured by a fall of rock at mine 61, Kansas and Texas Coal Co. According to information gathered, a loose rock extending from the mouth of the room where Price worked, nearly across the entry, fell on him as he passed, cutting thigh, side and otherwise bruising him seriously, but we were informed there were no bones broken.

November 9, 1901, Alex. Tilley was injured by a trip of full cars at mine 61, Kansas & Texas Coal Co. Tilley was a boy, 14 years of age, and engaged as a trapper, and while at work at said mine, in attempting to shut the door after a mule and his trip had passed through, he was knocked by another trip which was following close to the first trip, which the boy failed to see, until it ran into the door, knocked him down, catching his leg under the car, breaking both bones a few inches above the ankle.

November 16, 1901, William Patterson was injured by a fall of top coal at mine No. 66, Kansas & Texas Coal Co. Patterson was working in an entry and had left some top coal hanging behind, and while at work the coal fell on him, cutting his face and head considerably, brusing shoulder and side and breaking two of his ribs.

August 18, 1900, John Varschek was injured at the mine of the Helmet Mining Co., at Lingo, by the explosion of a shot. It seems that Varschek had lighted the shot and went out on the entry when more shots were fired, and supposing his shot had missed, he went back to his room when the shot went off, burning and bruising him severely. This man was working alone and it was some time after the accident occurred before he received any assistance. While he was seriously injured no bones were broken.

RANDOLPH COUNTY.

January 5, 1901, Lon Haggard was injured by a fall of slate on the entry in a mine near Huntsville, operated by the Morris Bros. Haggard was standing on the entry waiting for his car when a piece of slate fell on him, dislocating his hip, but escaped without receiving any other injuries.

February 22, 1901, William Watts and Joe Roman (two colored miners) were injured at the Morris mine, near Huntsville, from the premature discharge of a shot. From the information I gathered on my visit to the mine in a few days after the accident, the place being practically as it was when it occurred, no work having been done there, I discovered that the two men had drilled a deep hole and had it heavily charged with powder and were in the act of tamping the hole, when the tamper struck sulphur in the hole, causing a spark of fire, which ignited the powder, resulting in the explosion which seriously and fatally injured the two men. We were informed that Watts died from its effects about a month after the accident, and Roman is still a cripple and unable to work. When the powder exploded in the hole it came out in a sheet of fire and flame and hurled back some coal and made an opening on the rib side. I attribute the cause of this accident solely to the carelessness and ignorance of the victims themselves.

TABLE V.—Accidents in Coal Min

No.	Name of company or operator.	Name of injured person.	Date of acc't.		Occupation of the injured person.	Age.
			Month.	Year.		
1..	Kansas & Texas Coal Co......	Thomas Downs.	Jan. 7.	1901	Driver,......	24
2..	Rombauer Coal Co, ...	Lowery Robb.........	" 9.	1901	Miner........	17
3..	Central Coal & Coke Co.......	Thomas Latcham...	" 21.	1901	Shot-firer...	32
4..	Kansas & Texas Coal Co......	William Frost........	" 22.	1901	Driver	21
5..	Central Coal & Coke Co.	R. D. Williams.......	" 23.	1901	Shot-firer. .	29
6..	Kansas & Texas Coal Co......	Nevirilla Silvio.....	Feb. 1.	1901	Miner.......	23
7..	Kansas & Texas Coal Co......	Fritz Starchiss.......	" 7.	1901	Driver.......	22
8.	Morris Coal Co,...............	Lon Haggard.........	" ...	1901	Miner.......	27
9..	Morris Coal Co.................	Wm. Watts (col'd)...	" 22.	1901	"	23
10..	Morris Coal Co................	Jas. Roman (col'd)...	" 22.	1901	"	32
11..	Morris Coal Co................	Jas. Prinson (col'd)..	" 22.	1901	Driver......	29
12..	Kansas & Texas Coal Co......	Walter Grayham....	Mch. 15.	1901	Miner.......	26
13 .	C. B. Havens & Co.............	Mansfield Tayler.....	" 16.	1901	"	28
14..	C. B. Havens & Co............	Orisso Alexandro....	" 23.	1901	"	26
15..	Kansas & Texas Coal Co......	John Red.............	Apr. 2.	1901	"	35
16..	Kansas & Texas Coal Co.......	Marvin Belscher.....	" 19.	1901	"	33
17..	Kansas & Texas Coal Co......	W. H. Haley.........	" 29.	1901	"	30
18..	Rombauer Coal Co............	Evan Jones...........	June 17.	1901	"	54
19..	Wear Coal Co.......	Charles Karlson.....	July 25.	1901	"	38
20..	Arthur Coal & Mining Co....	Lawson Glenn........	" 11.	1901	"	25
21..	Kansas & Texas Coal Co......	Antonio Oberto......	" 17.	1901	"	43
22..	Kansas & Texas Coal Co.. ...	Richard Woodfin.....	Aug. 14.	1901	Driver.......	29
23..	Kansas & Texas Coal Co......	Aubrey Rise..........	" 23.	1901	Miner.......	21
24.	Merlin Coal Co.................	M. Williams (col'd)...	Sept. 20.	1901	"	28
25..	Northwestern Coal & M. Co..	Peter Dorr............	Oct. 14.	1901	Driver......	18
26..	Kansas & Texas Coal Co	Geo. Stewart (col'd)..	" 15.	1901	Miner.	27
27..	Kansas & Texas Coal Co......	Sebastian Targetta..	" 31.	1901	"	30
28..	Kansas & Texas Coal Co......	Alex. Tilley..........	Nov. 9.	1901	Trapper.....	14
29..	Kansas & Texas Coal Co	Wm. Patterson......	" 16	1901	Miner.......	42
30..	Kansas & Texas Coal Co......	U. S. Kirtley........	" 14.	1901	Driver......	35
31..	C. B. Havens & Co...........	Neil Malloney.	Dec. 16.	1901	Miner.......	35
	Totals.....................	... .	....	......	....	....

ounties for the Year 1901.

No. of children	Accident.		Insured?		Am't of insurance	Nature of accident.	Coroner's verdict.
	Fatal	Non-fatal	Yes	No			
		1		1		Injured by mine car	
	1			1		Premature shot	Accidental death.
4	1			1		Windy shot	Unavoidable accident.
	1			1		Fall of rock	No inquest; cor. viewed body
	1			1		Windy shot	Unavoidable accident.
		1		1		Explosion of powder	
		1		1		Mine car	
		1		1		Fall of rock	
		1		1		Explosion of powder	
		1		1		Explosion of powder	
		1		1		Explosion of powder	
		1		1		Fall of roof	
		1		1		Premature explosion of shot	
		1		1		Premature explosion of shot	
2	1			1		Fall of roof	Accidental
		1		1		Explosion of powder	
2	1			1		Fall of roof	Accidental
	1			1		Fall of roof	No inquest
	1			1		Going back on shot	Accidental
	1			1		Fall of roof	No inquest
3	1			1		Fall of coal	Accidental
		1		1		Fall of roof	
		1		1		Fall of roof	
2	1			1		Fall of roof	No inquest.
	1			1		Car left trk; knocked out prop	No inquest.
	1			1		Fall of roof	Accidental
	1			1		Fall of roof	No inquest
		1		1		Mine car	
1		1	1		$2,000	Fall of coal	
1	1			1		Mine car	No inquest.
		1		1		Fall of roof	
15	15	16	1	30	$2,000		

254,000 tons to each life lost. 238,135 tons to each non-fatal.

TABLE V.—Accidents in Coal Mines

No.	Name of company or operator.	Name of injured person.	Date of acc't.		Occupation of the injured person.	Age.	Single.
			Month.	Year.			
1.	Kansas & Texas Coal Co.	Thomas Downs.	Jan. 7.	1901	Driver,	24	1
2.	Rombauer Coal Co,	Lowery Robb.	" 9.	1901	Miner.	17	1
3.	Central Coal & Coke Co.	Thomas Latcham.	" 21.	1901	Shot-firer.	32	.....
4.	Kansas & Texas Coal Co.	William Frost.	" 22.	1901	Driver	21	1
5.	Central Coal & Coke Co.	R. D. Williams.	" 23.	1901	Shot-firer.	29	1
6.	Kansas & Texas Coal Co.	Nevirilla Silvio.	Feb. 1.	1901	Miner	23	1
7.	Kansas & Texas Coal Co.	Fritz Starchiss.	" 7.	1901	Driver.	22	1
8.	Morris Coal Co,	Lon Haggard.	" ...	1901	Miner.	27	1
9.	Morris Coal Co.	Wm. Watts (col'd).	" 22.	1901	"	23	1
10.	Morris Coal Co.	Jas. Roman (col'd).	" 22.	1901	"	32	1
11.	Morris Coal Co.	Jas. Prinson (col'd).	" 22.	1901	Driver.	29	1
12.	Kansas & Texas Coal Co.	Walter Grayham.	Mch. 15.	1901	Miner	26	1
13.	C. B. Havens & Co.	Mansfield Tayler.	" 16.	1901	"	28	1
14.	C. B. Havens & Co.	Orisso Alexandro.	" 23.	1901	"	26	1
15.	Kansas & Texas Coal Co.	John Red.	Apr. 2.	1901	"	35	.....
16.	Kansas & Texas Coal Co.	Marvin Belscher.	" 19.	1901	"	33	1
17.	Kansas & Texas Coal Co.	W. H. Haley.	" 29.	1901	"	30	.....
18.	Rombauer Coal Co.	Evan Jones.	June 17.	1901	"	54	1
19.	Wear Coal Co.	Charles Karlson.	July 25.	1901	"	38	1
20.	Arthur Coal & Mining Co.	Lawson Glenn.	" 11.	1901	"	25	.....
21.	Kansas & Texas Coal Co.	Antonio Oberto.	" 17.	1901	"	43	.....
22.	Kansas & Texas Coal Co.	Richard Woodfin.	Aug. 14.	1901	Driver	29	1
23.	Kansas & Texas Coal Co.	Aubrey Rise.	" 23.	1901	Miner.	21	1
24.	Merlin Coal Co.	M. Williams (col'd).	Sept. 20.	1901	"	28	.....
25.	Northwestern Coal & M. Co.	Peter Dorr.	Oct. 14.	1901	Driver	18	1
26.	Kansas & Texas Coal Co	Geo. Stewart (col'd).	" 15.	1901	Miner.	27	.....
27.	Kansas & Texas Coal Co.	Sebastian Targetta.	" 31.	1901	"	30	1
28.	Kansas & Texas Coal Co.	Alex. Tilley.	Nov. 9.	1901	Trapper.	14	1
29.	Kansas & Texas Coal Co	Wm. Patterson.	" 16	1901	Miner.	42	.....
30.	Kansas & Texas Coal Co.	U. S. Kirtley.	" 14.	1901	Driver	35	.....
31.	C. B. Havens & Co.	Neil Malloney.	Dec. 16.	1901	Miner.	35	1
	Totals.						22

by Counties for the Year 1901.

Married	No. of children	Accident.		Insured?		Am't of insurance	Nature of accident.	Coroner's verdict.
		Fatal	Non-fatal	Yes	No			
			1		1		Injured by mine car	
		1			1		Premature shot	Accidental death
1	4	1			1		Windy shot	Unavoidable accident
		1			1		Fall of rock	No inquest; cor. viewed body
		1			1		Windy shot	Unavoidable accident
			1		1		Explosion of powder	
			1		1		Mine car	
			1		1		Fall of rock	
			1		1		Explosion of powder	
			1		1		Explosion of powder	
			1		1		Explosion of powder	
			1		1		Fall of roof	
			1		1		Premature explosion of shot	
			1		1		Premature explosion of shot	
1	2	1			1		Fall of roof	Accidental
			1		1		Explosion of powder	
1	2	1			1		Fall of roof	Accidental
		1			1		Fall of roof	No inquest
		1			1		Going back on shot	Accidental
1		1			1		Fall of roof	No inquest
1	3	1			1		Fall of coal	Accidental
			1		1		Fall of roof	
			1		1		Fall of roof	
1	2	1			1		Fall of roof	No inquest
		1			1		Car left trk; knocked out prop	No inquest
1		1			1		Fall of roof	Accidental
		1			1		Fall of roof	No inquest
			1		1		Mine car	
1	1		1	1		$2,000	Fall of coal	
1	1	1			1		Mine car	No inquest
			1		1		Fall of roof	
9	15	15	16	1	30	$2,000		

254,000 tons to each life lost. 238,135 tons to each non-fatal.

INSPECTION BY COUNTIES.

ADAIR COUNTY.

(Production, 347,047 tons.)

Adair county can now be classed as very prominent among our large coal-producing counties. The year ending June 30, 1900, found this county ranking No. 15, now she stands fifth in the rank of coal-producing counties, and showing an increased production for the year of 92 per cent. No such increase at any time in this State has been made by any other county, and its continued increase in production may be reasonably expected for many years to come, as its surface is almost entirely underlaid with two workable seams of coal and comparatively speaking, its mining may be said to be in its infancy. This indicates how rapidly development in this coal field has progressed during the past year. Seven new mines have been opened and each equipped with the necessary machinery to do an immense business.

Danforth Post Office.

C. B. Havens Coal Co., H. T. Lemist, president; J. T. Reavlsey, superintendent. This company owns and is operating two mines in the vicinity of Danforth, both having shipping connection with the Omaha, Kansas City & Eastern Railroad by spur switches, extending from the main track to the mines. Both have shaft openings and steam power is used at both mines to bring the product to the surface. The same seam of coal is worked at each and the same method of mining practiced. Ventilation is secured by the aid of ventilating fans at both of the mines.

Mine No. 1, Punch Kirby, foreman. This mine is located one-half mile east of Danforth. Shaft 50 feet deep. Equipped with machinery for hoisting, and ventilated by a 10-foot fan. On my first tour of inspection of the mines of Adair county during the past year, I visited this mine on the 23rd of October, 1900, and made a thorough inspection, and found it in good condition, with the ventilation satisfactory. Made a test of the air on second north entry, on the east side, and found 15,300 cubic feet of air passing, which volume furnished air to 68 men on the east side, and while the current was overloaded with work and more or less vitiated with impurities when it reached the last of the workings, yet the quantity was almost double that required by the mining laws, and the men did not suffer any inconvenience therefrom. The west side and the two main north entries off of the west were found well ventilated and in good condition. I discovered on this visit that a new escapement shaft had been sunk at the proper distance from hoisting shaft, and a good, convenient stairway built in same for an avenue of escape for the employes in case an accident to main shaft. I returned to this mine on the 9th of April, 1901, made a thorough and a careful inspection and found it in excellent condition, with the ventilation fully up to the requirements of the law, and every other feature about the mine satisfactory. Tests of the ventilative currents was taken at five different points in the mine on this visit, and each test showed that the required amount of air prescribed by the mining law was passing. I inspected every foot of air-courses on this visit and found them high, wide, clean and roomy.

The pernicious habit of firing from 15 to 20 kegs of powder at the noon hour every day was practiced at this mine at the time of this visit, and entering the mine while the shots were being fired, I started to inspect the condition of the same as soon as the miners commenced working after dinner, and while we traveled in the direction of the air currents we did not encounter or come in contact with powder smoke. Indeed, we failed to detect or notice a particle of smoke or any semblance of it in any part of the mine, although two shots were fired at a large number of places, thus showing plainly the healthy condition of the mine and its practical and careful system of ventilation. Although only a few days previous to this visit, some of the radical element working in this mine sent a complaint to the Governor, claiming a deficiency in the ventilation, which complaint was entirely uncalled for.

I visited the mine again on the 27th of August, 1901, and found everything very satisfactory. The air on the north entries off the east was found fresher and stronger than on previous visit and less number of men were working in that current. The air on the west side was all right also at this date, I made another careful inspection on the 26th of December and found the mine in a satisfactory condition, but as only a few of the miners were at work at this date no test of the air was taken. All doors were found in good repair and the air-courses in good condition to carry the air. Coal about 44 inches thick and *worked on the room* and pillar plan, and extracted by blasting it off the solid. The roof over the coal is of a friable nature. It cuts, crumbles and falls when exposed to the air, and requires a large amount of timber set to keep it secure. There were from 100 to 125 working in the mine at the various dates of inspection, and 65 cents per ton paid for mining unscreened coal. The product is shipped and consumed at Council Bluffs, Omaha and points west and northwest.

Mine No. 2, Mose Simpson, foreman. This mine is located half mile south of Danforth, and connected with the K. C., O. & E. R. R. by a spur switch, extending from main track to the mine. Shaft 65 feet deep, and equipped with first-class machinery for hoisting, ventilating and operating the mine. This is a new mine, shaft sunk and mine opened out during the spring and summer of 1901, when coal was struck at the above mentioned depth. The equipment of the mine consists of a pair of Litchfield engines, with 16x30 inch cylinders connected to a 6-foot drum working on first motion. The machinery is set on a good rock foundation and enclosed by a good engine and boiler house. Steam is supplied by two 12-6-inch flue boilers, 54 inches in diameter and 16 feet long. The headgear and top building are well constructed, and conveniently arranged. The Coal is dumped from a self-dumping cage into a hopper, where it is weighed on a hopper scale, after which it is delivered to a shaker screen, which screen cleans and grades the coal into different grades and sizes. Three tracks are provided for the different grades, with plenty of yard room to hold full and empty cars. The escape and hoisting shafts were both sunk at the same time. The escapement shaft is divided into two compartments, one of which for the air passage way proper is 7x7 feet, and the stairway 3x7 feet. The stairway is constructed in sections, about 10 feet long, with steps 24 inches wide, set at an angle of about 40 degrees, making the descent and ascent easy. The fan house is located about 350 feet from hoisting shaft. The fan is 14 feet in diameter and is operated by a 10x20 inch cylider upright engine, connected direct to the fan shaft. It is set on a substantial rock foundation, and the fan house and casing are so constructed as to allow the fan to force or exhaust as the requirements of the mine may be. I made a thorough inspection of this mine on the 28th of August, 1901, and found the work confined to driving entries preparatory to opening it up. Connection had been made between the two shafts, and the fan was set, but was not running at this date, as no steam connection had been made. The mine will be operated on the treble entry room and pillar plan, and the underground plan and opening contemplates entries turned at right angles from main entries. and at a distance of about 350 feet from the bottom of the shaft on each side an overcast will be erected, thus making two separate and distinct currents of air on each side. All entries and airways are constructed with a view, should it become necessary, to ventilate either pair separately. The shaft bottom is well constructed and arranged for the handling of a large tonnage, and that with rapidity and economy. All the full cars will be caged on one side, or west side of the shaft, and the empties taken out on the other side. This system is practically new and very little practiced in our mines, and while there is a diversity of opinions among mine men as to which plan is the best, the old system of caging on each side of the shaft, or the new one, the writer favors the latter for various reasons. The shaft bottom is high, wide and roomy and well secured by large and strong timber, very practically set. The mine, as equipped and planned, contemplates a large output and will soon be a great factor in the coal production of Adair county. I made another inspection of this mine on the 26th of December and found everything in first-class condition. Cross entries had been started on each side and about 40 men employed. I discovered that the roof stands better here than in mine No. 1, and requiring less timber. Thickness of coal, mode of working and price paid for mining is the same as that at mine No. 1.

Fegley Post Office.

Rob't Besanko is operating a mine near Hazel Creek. Shaft 45 feet deep hoisting by a horse. This mine is working the upper seam, which is about 4 feet in thickness. A small furnace is used to furnish ventilation. The mine is only operated in the fall and winter to supply local trade. All the coal is taken away from the mine in wagons and consumed in the surrounding country.

P. McCrabe is operating a mine in the same locality, shaft 25 feet deep hoisting by a horse. Coal about 4 feet thick and worked on the room and pillar plan to supply local trade.

Thos. Scott operates a mine on the Culler land in the fall and winter to supply home trade.

F. I. Miller operates a mine near Hazel Creek during the cold season to supply local trade.

There are a few other small mines operated in the vicinity of Fegley during the winter months, but only on a small scale to supply home consumption. The section of country bordering Hazel Creek and along the banks of the Chariton river is nearly all underlaid with a good vein of coal, which is of fine quality for all purposes. Extensive mines could be opened out if nearer to a railroad, but being 8 or 10 miles away from shipping facilities the output of its mines is very small and confined to local demand.

Kirksville Post Office.

D. C. Scott is operating a mine on Hazel creek about 10 miles north of Kirksville and its product is hauled away in wagons and a large por-of it consumed at Kirksville. The mine is a shaft opening, 52 feet in depth and hoisting is done by a horse. Coal 4 feet thick and worked on the room and pillar plan. Employment is given to 10 or 12 men.

Kirksville Coal & Construction Co.

This company sunk a shaft about half a mile west of Danforth and was setting up the machinery at date of my last visit to the mines of this county. A switch had been constructed from the railroad to the mine, but as no coal had been taken out or the mine developed, I must leave any further remarks concerning it to the next report.

Novinger Post Office.

Rombauer Coal Co., R. G. Rombauer, president and manager, and Martin Rabbitt, superintendent.

This company owns and is now operating two mines in the vicinity of Novinger, both of which have shipping connections with the Omaha, Kansas City & Eastern railroad. Both mines have shaft openings, are equipped with machinery for hoisting, are working the same coal seam and on the same method; ventilation is furnished to both mines by the aid of fans.

Mine No. 1 is located about one mile west of Novinger and connected with the O., K. C. & E. R. R. by a switch. Shaft 50 feet deep, equipped with very fair machinery for hoisting.

The ventilation is produced by a 10-foot fan, which furnishes plenty of air to the mine. I made the first inspection of it on the 24th of October, 1900, and found it in good condition, the volume of air was double the amount required by the mining laws, but having a long distance to travel around the mine in one undivided current, I found it was overloaded with work and became very impure before it reached the last of theworkings; but on my route and further into the mine I discovered that preparations were being made to split the air volume and make another current. I made another inspection on the 10th of April and found the mine in excellent condition and the ventilation was very satisfactory. I discovered that an overcast had been erected over the main north at the 11th east entry and the air was conducted around in two separate currents, making the ventilation stronger and the air fresher in every part of the mine. I inspected it again on the 27th of August and found everything satisfactory. I returned again on the 26th of December and made another careful inspection and found the mine in good shape, with the laws closely observed and obeyed. The coal territory of this mine all lays on the north side of the shaft, confining all the work to one side; the mine having been a large producer, naturally the work traveled very fast and the coal is now hauled three-quarters of a mile; the air currents also have a long route in passing through the workings. Coal 45 inches thick and worked on the room and pillar plan. The roof is of the soapstone and slate mixture, strong and hard, stands well and is easily secured by timbering. The entries are high, wide, clean and dry, with good roadways. About 100 men and boys employed, and mining is paid for at the rate of 65 cents per ton for unscreened coal. The product is shipped to Omaha and points west and northwest.

Mine No. 2 is located three-quarters of a mile directly north from the Novinger depot building, and has shipping connection with the Omaha, Kansas City and Eastern railroad by a spur switch. Shaft 70 feet deep and equipped with first class machinery. The sinking of shaft, construction of buildings, the placing of the equipment of the mine, as well as the construction of the switch was begun during the past summer and at the close of the year I found 50 miners employed and the company daily putting on more men. The equipment of the mine consists of a pair of engines with twin cylinders geared up one in four, they have 10-inch bore and 12-inch stroke, connected direct to a 4-foot drum. The engines were built by the Eagle Iron Works, in Des Moines, Iowa, designed by the Aulman Bros., who have paid great attention to the equipment of coal mines. The steam is furnished by two 2-flue boilers 20 feet long and 48 inches in diameter, so arranged that they can be used either separately or jointly. All the machinery is set on solid foundation laid and built with vitrified brick and cement, and all enclosed by commodious buildings. The engine house, including the boiler room, is 20 by 50 feet. The engine room is 14 by 20 feet, being entirely separated from the boiler room. The head gear is 50 feet from the ground to the pully wheels, and 33 feet from top rail to top landing from which the coal is dumped. The coal chute is constructed of boiler iron and so arranged as to make 6 grades of coal: the smallest, the first grade, is called nut mixture. This contains coal from slack up to three-quarters of an inch, through a bell-shaped revolving rotary screen. The second grade, nut coal, is from three-quarters to one inch. Third grade, the company calls, cocoa nut coal, which is from one inch to two and one-half inches in size. Fourth grade, large cocoa nut from two and one-half to four and one-half inches. Fifth grade, mine run coal, and the sixth, lump. All the screens are so arranged as to be covered up with a solid flat sheet in a few seconds, showing that the company can make lump coal from that which contains everything above one inch, or lump coal which contains everything above two and one-half inches or lump coal which contains everything above four and one-half inches, which is a great saving.

The yard room and track switches are very systematically arranged, and we do not believe that there is to be found more convenient or more practical shaft switches constructed at any mine in this or any other state in the country. The tracks are constructed in a shape that is known in railroad parlance as a switch ladder. The track has a run around, permitting the locomotive which sets in empties and takes out loads, to pass the chute and perform the work without in a particle interfering with the loading at the shaft. A blacksmith and a machine shop is also provided for at this mine, 20 feet wide by 30 feet long, with an L attachment to be used as an office for the mine foreman. The shop is equipped with lathes, power punch, cutter, drill press, emery wheels, grindstone, formers for coal box irons, a modern cart iron forge and all other tools necessary for the economical management of a smith shop in making all the repairs of the mine.

The shaft is 7x13½ feet, partitioned into cageways and curbed by strong oak timber from top to bottom. The escape shaft is located 300 feet from hoisting shaft and is 6 feet wide by 11 feet 6 inches long, partitioned off into two compartments, one of which for the air passage way proper, while a stairway is built in the other for a manway for the men to go up and down to the mine. A 12-foot ventilating fan is set on top of the escape shaft carrying blades 4 feet wide. The fan house and casing is so constructed as to allow the fan to force or exhaust as the requirements of the mine may be. The mine is operated on the double entry room and pillar plan, and at a distance of about 300 feet from the shaft bottom overcasts will be erected which will give each side of the mine two separate and distinct currents of air, making in all four currents, which is a very practical and up-to-date system of ventilating mines. The double track and switches at the shaft bottom extends 150 feet to the south, and the same distance to the north, which are the main entires, while the cross entries will be driven in an east and west direction. The mine as equipped, planned and opened out, contemplates a large output and will soon be a great factor in the coal production of this county. About 40 houses have been built by the company near the mine for the accommodation of the miners. The houses are all new, containing from 3 to 4 rooms to suit families. They are built of the best grade of lumber and other material and are as commodious as material and workmanship can make them. The mine being newly sunk and equipped I only made one inspection of it the latter part of the year, when I found the communication between the two shafts had been made and the ventilation volume was circulating around in great quantity. Indeed the inspector does not expect much annoyance and work in inspecting mines so well equipped as this mine is, as it is up-to-date in every respect. The coal is about 45 inches thick and overlaid by good roof and easily secured. The bottom of the shaft is high, wide and roomy, and secured by strong timber. The product is shipped to points west.

Kansas City Midland Coal & Mining Company. Bernard Corrigan, President. Jas. Ward, Superintendent.

This company owns and is operating two mines northeast of Novinger. Both mines are new, having been sunk and developed since the last annual report was issued; both have shaft openings, are working the same seam of coal, on the same plan and under the same management; both are equipped with steam power for hoisting, and ventilation is furnished by the aid of fans at both mines.

Railroad connection is obtained by a switch 6,000 feet in length extending from the main track of the Omaha, Kansas City and Eastern railroad to mine No. 1, and extended 5,000 feet still further to connect mine No. 2 with the same railroad.

Mine No. 1, Pat Riley, Foreman. This mine is located one milé northeast of Novinger; shaft 80 feet deep, and equipped with good machinery for hoisting. The pit top and head gear are very well constructed and the equipment of the mine embraces many modern improvements. The escapement and hoisting shaft were both sunk at the same time. The escapement shaft is divided into two compartments, and a stairway is built in one, while the other compartment is used for the passage of air. The ventilation is furnished by a 12-foot fan set on top of the escape shaft, which is well constructed and forces the air into the mine. I made the first inspection of the mine on the 24th of October, 1900, and found it in excellent condition. The ventilative volume is divided at the bottom of the downcast to the north and south, from which entries it circluates around the east and west entries in great quantities. I inspected the mine again on the 10th of April, 1901, and found it in a satisfactory condition, with the ventilation furnished double the amount required by law, which was also fresh and healthy. On the 27th of August I visited the mine again and found it in good condition, but as the mine was not running at that date and no men at work no notes of the air was taken. I visited the mine again on the 27th of December, 1901, and made a thorough inspection, the result of which was very satisfactory. The ventilation was found strong and fresh all around the mine, the entries high, wide, dry, safe and clean, and the ropes, cages safety catches, with all the machinery, in first class condition. Coal 3 feet thick and worked on the double entry room and pillar plan. The roof over the coal is of the soapstone and slate variety, strong and hard, stands well in rooms and entries, requiring very few timbers to keep it secured. About 130 men employed. The product is shipped to Kansas City, Omaha and points west and northwest.

Mine No. 2, Ed White, Foreman. This mine is located one mile north of mine No. 1, and two miles northeast of Novinger. The switch from mine No. 1 was extended to connect with this mine, making its shipping connection with the same railroad as the latter. The shaft is 147 feet in depth and equipped, not only with first class machinery, but embracing all other modern improvements. The engines were built by the Eagle Iron Work of Des Moines, Iowa, consisting of twin cylinders 12x16 inches, connected to a 6-foot drum, working on second motion. The steam is furnished by two tubular boilers 14 feet long and 54 inches in diameter, having 34 4-inch flues in each boiler, made by the same firm. The machinery is set on solid foundation, laid with vitrified brick and cement 5 feet deep, and all enclosed by commodious and convenient buildings. The boiler room is 32 feet by 30 feet, and the engine room 24 feet wide by 28 feet long and entirely separated from the boiler house. The top landing and tipple house is 28 feet wide and 42 feet long, the pit head or tower is 58 feet high to top of head gear and 32 feet to landing. The coal is dumped from a self-dumping cage into a hopper, where it is weighed on a hopper scale, after which it is delivered to a screen, which screens and grades the coal into different sizes and different tracks are provided for each grade. The hopper pocket is 14 feet long, 8 feet wide, with a 9-foot fall for the coal to drop when discharged from the cage. A blacksmith shop is also provided for at the mine 28 feet wide by 34 feet long, equipped with a modern cast iron forge, drill press, cutter, punch, formers for coal box irons and all necessary tools to make new and repair pit cars and other repairs of the mine.

The escape and hoisting shafts were both sunk at the same time, the hoisting shaft is 7x14 feet in the clear and curbed with 3-inch white oak lumber, 6 by 6 inch girders, and bunting 4 by 8 inches set edgeways in the center and extra bunting of same size set at each end 15 inches apart. The escapement shaft is 7 by 7 feet and divided into two compartments, one of which the air passage way proper is 3 by 7 feet and a stairway is built in the other compartment for an avenue of escape for the employes in case of an accident to main hoisting shaft. The escapement shaft is located about 350 feet from the hoisting shaft, and a fan is set on top of same, operated by a 10 by 12 cylinder horizontal engine connected direct to the fan shaft. The fan house is so constructed as to allow the fan to force or exhaust as the requirements of the mine may be. The mine is operated on the double entry room and pillar plan and the underground plan contemplates entries turned at right angles from main entries, and at a certain distance from the shaft bottom on both sides of the shaft overcasts will be erected which will give each side of the mine two separate currents of air, making in all four currents; all entries and air-courses are arranged and constructed with a view to ventilating each separately should it become necessary.

The mine as planned and equipped is destined to be a great producer. The bottom of the shaft is 14 feet wide and 8 feet high and timbered with 12x12 inches square sawed timber 3 feet apart and practically set. A double track is constructed a distance of 200 feet on each side from the shaft towards the coal face, making it very convenient to handle a large amount of coal. I made one inspection of this mine on the 27th of December and discovered that two sets of cross-entries had been started and about 40 men were employed. The coal will average about 44 inches in thickness and is extracted by blasting it off the solid. The roof over the coal is of the soapstone and shale variety, making a first class roof and requiring but very little timber to keep it safe and secured.

A large number of houses and a supply store have been built at the mines for the accommodation and home of the miners. The houses are all new and quite a number of them have been built on the cottage plan, containing 2, 3 and 4 rooms to a house, to suit all sized families. There were 35 new houses built at mine No. 1 during the past year, one of which has 14 rooms and is used as a boarding house. One of these houses has 6 rooms, 7 have 4 rooms, and 26 are 3-room houses, all of which are built of good material and are well finished. There are also 20 new 4-room square houses built at mine No. 2 and 6 new 6-room houses built at the same mine, all of which are commodious, convenient, plastered, and well finished, all painted in light color, trimmed in suitable panels, giving the camp a bright, cheerful appearance.

As these mines are yet new, we shall have to wait their further development, before being able to report fully concerning their practical operation. The product from the mines is shipped to Kansas City and points west.

Manufacturers' Coal & Coke Company. H. F. Redding, President, and G. W. Evans, Superintendent. This company owns and is operating two mines at Ninevah, which is a mining camp located 3 miles north of Novinger. This camp came into existence during the past summer after this company had sent prospectors to the new coal field with an outfit of *prospecting* tools in search of coal, they soon succeeded in discovering the black diamond in an inexhaustible quantity and coal land was bought and leased. With the construction of four miles of railroad, the building of a supply store and 75 residences for homes and the accommodation of the miners, has in connection with the opening of three new mines transformed a section which only a few short months ago was a vast wilderness—into a scene of activity where now a thriving town invites the hundreds of miners which are needed and will be added to its population. When these new mines receive their full quota of employes the development of an immense coal field, so far merely tapped, will work wonders in the advancement of this county to the very forefront of our coal producing counties. The progress of the coal industry as now realized by Adair county was predicted by me in several of my previous reports, and while it is no surprise to me, yet it is a matter of great gratification to me to see her proving herself possessed of one of the greatest coal fields in the State.

We have been informed that this company contemplates extending this new railroad further north to the State line and intersect with the coal field of southern Iowa, which seam extends and underlies Putnam, Schuyler and Adair counties, and as this new railroad extends further north it will come in contact with the upper or the Iowa coal seam and wherever its worked proves to be of better quality for domestic purposes than the seam now worked at these mines. The upper seam is now mined within 3 miles to the present terminus of this new branch and as it extends further north it will traverse over two workable seams of coal, both of which are of good thickness and can be operated profitably.

Mine No. 1 is located half a mile south of Ninevah. It is entered by a slope and ventilated by a 12-foot ventilating fan. The coal is taken out to the surface by steam power and over an elevated trestle and landed at a large building erected for the purpose of weighing and dumping the coal into a chute, then screened and graded into different grades and sizes and loaded into cars; 3 tracks have been constructed and built under the chute to load the various grades and sizes. The mine is operated on the trebble entry room and pillar plan, the main entry running west and cross entries are turned at right angles to the north and south. The ventilative volume of air was conducted around the workings in one undivided current at date of last inspection, but preparation was being made to split the air into separate currents and ventilate each set of entries by a current to itself. After making a thorough inspection of the mine on the 27th of December I was more than gratified at its excellent condition and development during the short time it had been in operation, the very practical character of all the improvements made with the economic arrangements in space employed are admirable, the fan as constructed for ventiating purposes gives most satisfactory results—while running at 15 revolutions per minute it was found to be producing a volume of air double the quantity required or necessary to keep the air of the mine fresh, healthy and clear of smoke, the current was also conducted around the mine in a practical and systematic manner. The coal will average about 45 inches in thickness throughout the mine and running regular and of a very uniform thickness, and we could not discover a place in any part of the mine that furnished even a suspicion of a fault, horseback, clay-slip or other trouble to mar the face of a clean, healthy seam of coal. The roof over the coal is of the shale-soapstone variety, strong of its nature, standing well in rooms and entries and very easily secured by timber. The entries are high, wide, dry and clean, and considering the condition generally the coal, ventilation, roof, roadways and the practical management, it can be easily termed a first class mine. There were 70 men employed at date of this inspection, and more men are daily being put to work. The product is consumed at Kansas City and points west.

Mine No. 2 is located one-half mile northeast of Ninevah and about one mile from No. 1. This mine also is entered by a slope, and preparation was made at date of my visit to the mine to build and set the machinery to haul out the product by steam power. The branch railroad had not reached this mine at this time, and while a large amount of coal had been taken out, and considerable entries had been driven, the shipment of coal had not commenced, but a large force of men were found at work grading the railroad and building the trestle and tipple house, constructing the track and setting the machinery and long before this report will be in the hands of its readers this mine will be producing a large tonnage.

The coal at No. 2 is about the same thickness as that at mine No. 1 and practically about the same character of roof, yet I noticed on my visit to the mine one thing unlike the conditions existing at mine No. 1, that is a bench rock in the coal of considerable thickness at the face of the main south entry, which will prove an annoyance and entail an additional expense in handling it, and we hope will soon run out, and indications pointing that way looked favorable in a cross-cut on the west side as the rock was running low and thin as though it would likely pinch out, while on south and east the rock was fully 12 inches thick about the place the clay band occupies from 10 to 12 inches from the bottom. The mine will be operated on the trebble entry room and pillar plan, and ventilated by a fan, but no ventilating appliance had been applied at date of my visit, or system of ventilation adopted, and will write further about this mine after it is developed further. Both of these slopes are practically opened out and timbered. The timbers are 12x12, well set and lined, 6 feet high and wide enough for a double track in each slope, and in th every near future these mines will be great producers. In fact mine No. 1 has an output of 350 tons per day already and rapidly increasing on that output. About 75 houses have been built at Ninevah containing from 3 to 4 rooms to a house, all of which are plastered and painted, giving the camp a respectable and a cheerful appearance, but as the cold weather retarded the completion of the improvements will write more lengthy in next report.

Nenevah Coal & Mining Co. Mike McHugh, Superintendent. Mine located south of Ninevah and between mines Nos. 1 and 2 of the Manufacturers' Coal & Coke Co. This mine has a drift opening with a connecting track elevated sufficiently above the railroad track to permit of dumping. The coal is brought to the surface by machinery and landed on a tipple house from which place the coal is discharged into the chute, where it is cleaned and graded into different grades and sizes. The same seam of coal is worked here as that mined at the mines in the surroundings of Ninevah and Novinger, and the same method of mining is practiced here. The description of any of those mines suits the inside workings of this mine, in as far as the thickness of the seam, mode of working and the character of the roof is concerned. Ventilation will be furnished at this mine by the aid of a furnace, but there was no ventilating appliance built or any plan of ventilation adopted at date of my visit, and the mine only just started with 12 men employed. The product is shipped over the Omaha, Kansas City & Eastern R. R.

Johrn Paris is operating a drift mine in close proximity to the last named mine and on the same coal seam. Mine only operated during winter month, and the coal is consumed in the vicinity.

Stahl Postoffice.

American Fuel Company, A. F. Loveland, president; James Graham, superintendent. This company owns and is operating two mines in this place, both of which have shipping connection with the O. K. C. & E. R. R. Both mines have drift openings, same coal seam is worked with an underground connection, and for all practical purposes may be consideerd as one mine with two openings. The same furnace is used to ventilate both mines, which is set at Mine No. 1. I made an inspection of these mines on the 25th of October, 1900, and found a deficiency in the ventilation at Mine No. 1. The east part of this mine had been suffering from faulty coal which greatly affected the roof which fell and retarded the airways, thus causing deficiency in the air, but I discovered another air shaft in course of construction and was nearly down to the coal at this date which would increase the air volume and make it fresher on the straight east.

found the air satisfactory in Mine No. 2 at this date; another connection was to be made between the east entry at Mine No. 2 and the third north from No. 1, which, as soon as made, would make the air fresher and stronger. April 11th I made another inspection of these mines, and as on my former visit I found deficiency on the east part of Mine No. 1, and was surprised to discover that no connection had been made with the new air shaft as yet. To make matters worse several rooms had fallen in the long wall work, thus checking the current from passing through, which made the air very bad at that part of the mine, and the company was requested to make the communication through between this side and the new air shaft as speedily as possible. On the 29th of August I visited the mine again and made another close inspection. I discovered on this visit that the connection had been made between the straight east and the air shaft, and the air was found better in that part, but not fully satisfactory, and recommendation was made for further improvements on the east as well as at several other parts in both of the mines, as checks in the air was encountered at various places. There has not been a practical system of ventilation practiced at these mines for the past three or four years, and the miners have suffered thereby from insufficient ventilation, and to make matters worse the mines have had several changes in owners and managers during that time, and the present management worked under great disadvantage when it took charge of the mine. I visited it again on the 28th of December and found it in much better condition with the ventilation good all over the mine. I discovered the furnace had been removed and built at the new air shaft which was giving so much better results and was passing strong fresh currents of air to every part. The ventilation was better on this visit than we have found it for years. The coal from both mines was now taken out through Mine No. 1. The coal at this mine runs irregular and faulty, and the roof soft and friable when coming in contact with a fault thus causing great annoyance and trouble to keep air courses open and of sufficient area to pass the required amount of air through to properly ventilate the mine. Coal about 42 inches thick, and worked on the longwall plan. About 100 men employed. The product is consumed at various towns along the line and at Omaha and points west.

The company is opening another mine west of No. 1 across the branch. This mine is entered by a drift and ventilated by a furnace. The same seam is worked here on the method and under the same management as that of Mine No. 1.

Spring Valley Coal Co., Jeff. Bedford, president; Jno. Leonard, *foreman. Mine located* one-half mile east of Stahl, and has shipping connection with the O., K. C. & E. R. R. Mine entered by a drift and ventilated by a furnace, which was giving very fair results at dates of inspections. I made three inspections of this mine during the period covered by this report, and found it in very good condition at each visit. On my inspection made on the 29th of August, 1901, I discovered that considerable improvement had been made since my former visit; a larger furnace had been built which was furnishing more air into the mine. Dumps and ditches had been also made and the roadways corduroyed which made the roads dry and clean and the mine found in better condition than on any former visit. Coal 38 inches and worked on the longwall plan. Forty men employed in winter, and about 20 in summer. Eighty-two and a half cents per ton is paid for mining. The product is consumed at points west.

Karl Mainwald is operating a mine three miles north of Stahl. Mine entered by a drift and ventilated by a small furnace, and only running during the cold weather to supply home demand.

AUDRAIN COUNTY.

(Production, 44,066 tons.)

Audrain county stands 12th in rank of the coal-producing counties of the State. It is situated on the eastern border of the coal belt, and nearly all of it is underlaid with coal. Mining is carried on at various points throughout the county, but more extensively at Farber, Martinsburg and Vandalia, where shipping connection is made with the Chicago & Alton and Wabash railways. The same seam of coal is mined throughout the county, but in some sections faults are encountered, where the coal is cut out entirely, while at other places it dwindles down so thin as to make the vein unworkable. Ten mines were operated here during the past year and 137 men and boys were employed. Description of the principal mines is as follows:

Farber Post Office.

Farber Coal Co., C. Peterson, superintendent. Mine located at Farber, and has shipping connection with the Chicago & Alton R. R., by a switch. Shaft 104 feet deep, and operated by steam power for hoisting. I made a thorough inspection of this mine on the 8th of October, 1900, and found it in excellent condition, with the ventilation fully satisfactory and the mine clean and healthy. I visited the mine again on the 15th of June and found it in good condition and satisfactory. November 20th I made another thorough inspection and found the inside workings in good condition, with plenty of air circulating around

189495

every part of the mine, but the cages were without safety catches an the company was instructed to equip the cages with catches at once Coal 28 inches thick and worked on the longwall plan. About 30 me employed, and 91 cents per ton is paid for mining. The product is consumed at Jefferson City, Mexico and local towns along the line of railroad.

Martinsburg Post Office.

Kreiger Coal Company, Oscar Krieger, manager. Mine located one-half mile east of Martinsburg and connected with the Wabash railroad by a switch. Shaft 107 feet deep; operated by steam power Ventilation is furnished by a furnace with good results. The coal in some parts of the mine runs irregular and faulty, causing extra expense to operate it. The mine is also making a large amount of water which seeps in through the roof. I inspected the mine on the 2nd of October, 1900, and found the ventilation and condition of it satisfactory. I made another inspection on the 15th of June, 1901, and found everything in good condition. I visited it again on the 20th of November, but as the mine was not running, nor any steam up, no inspection was made. Coal 28 inches thick and worked on the longwall plan. About 20 men employed, and 91 cents per ton paid for mining. Coal consumed at local towns along the line of railroad.

Vandalia Post Office.

Vandalia Coal Co., Thos. Green, superintendent. Mine located one mile west of Vandalia and connected with the Chicago & Alton railroad by a switch. Shaft 75 feet deep; equipped with machinery for hoisting. Ventilation is furnished by an 8-foot fan, which is giving good results. First inspection was made on the 8th of October, 1900. and mine found in good condition, with a strong current of air passing around the face of the workings. June 14, I made another inspection and found that the requirements of the law were well observed. The airways were found in good shape and the mine in good condition. I made another inspection on the 18th of November and found everything satisfactory. Coal 28 inches thick and worked on the longwall plan, paying 91 cents per ton for mining. From 30 to 40 men employed. Product consumed by the railroad company.

The Mississippi Glass Company is operating a mine at Vandalia within the city limits. Shaft 65 feet deep and operated by steam power of hoisting. The coal is underlaid with good fire clay, which is taken out at another part of the mine, leaving the coal for roof. The clay mine is worked on the room and pillar plan and requires large timbers to keep up the roof. This mine was formerly owned and operated by the Vandalia Coal Co., but recently the present owners bought the plant and put in new machinery, improved the mine and enlarged its capacity. A fan has been installed in place of the old furnace and ventilation is now fairly well maintained. I inspected the mine on the 9th of October, 1900, 12th of June and again on the 18th of November, 1901, and found it in very fair condition at each visit. Coal twenty-eight inches thick and worked on the longwall plan. Nearly all the coal produced is consumed at the mine in the manufacture of the clay into bricks and other articles. Employment is thus furnished to quite a number of men and boys around the mine and brick works. Mining is paid at the rate of 91 cents per ton.

Standard Coal Co. Mine located at Vandalia. Shaft 80 feet deep, and operated by horse power. Considerable improvement has been made at this mine during the past year. An escape shaft was sunk, a new horse power apparatus erected, new pit head, top house, chutes, pump house and a blacksmith shop erected. This mine has no shipping connection, and while it has a very good output as a local mine, it could be largely increased if it had shipping facilities. The coal is taken away from the mine in wagons, and while a large portion of the product is consumed in the immediate surroundings, considerable is also shipped to other towns along the Chicago & Alton railroad. Mining is paid at the rate of ninety-one (91) cents per ton ,and employment is given to about 25 men in winter and 10 in summer.

There are other parties taking out coal on a small scale during the winter months in the neighborhood of Quiver, Hazel Creek, Ladodnia, Worcester and Benton City. The product from these mines is consumed at home.

BARTON COUNTY.

(Production, 183,983 tons.)

Barton county is largely underlaid with the coal measure formation, and coal is mined in nearly every township in the county, but in some sections on a limited scale only, owing to the shallowness of the covering, which renders underground mining impractical, and a large portion of the coal mined throughout the county is obtained by stripping. In the year 1891 this county ranked ninth on the list of the coal-producing counties of the State, with an output of 63,026 tons, but in the year 1896 she fell back to twelfth place, with an output of 37,570 tons of coal, but in the year 1900 new mines were opened and she advanced to 8th in rank, with an output of 141,520 tons, and in the present report she holds 7th place. We expect a steady increase in the output of coal from this county for years to come, as several new and very large mines are being opened out in the vicinity of Minden, which will place this county again among the large coal-producing counties of the State. Following is a full description of the principal mines relative to their sanitary and other conditions as found at dates of inspection:

Lamar Post Office.

There are several parties who operate mines in the surroundings of Boston and Lamar in the fall and winter to supply the local trade. The coal is only about 14 inches in thickness. The mines are entered by drifts and the coal mined on the room and pillar plan. It is taken away from the mines in wagons and consumed at Lamar and vicinity. The names of the respective operators and output of every mine, with other information, will be found in the statistical table of this county with this report.

Liberal Post Office.

Jos. Kaiser operates a mine near Liberal to supply local trade. Mine entered by a shaft and ventilated by a furnace. Coal 28 inches thick and worked on the room and pillar plan.

Joseph Travis operates a mine near Liberal. Mine entered by a slope and only operated during winter season to supply local demand.

Jno. J. Prosser operates a mine in same locality to supply home consumption.

Geo. Boulware operates a small mine near Liberal during the winter season to supply the local demand.

Rogers & Nicholson operate a mine on the Walser land. Mine entered by a slope and the coal is hauled in wagons, loaded on cars and shipped over the Mo. P. R. R.

There are several others who operate mines on a small scale in this locality during the winter season to supply home demand.

Minden Post Office.

Western Coal & Mining Co., Major R. M. McDowell, general manager; Jas. Gardner, general superintendent; W. A. Johnson, foreman. Mine located near Minden and has a shipping connection with the Mo P. R. R. by a spur switch extending from the main track. Shaft 56 feet deep and equipped with first-class machinery for hoisting and ventilating. I visited the mine on the 14th of November, 1900, and found it in excellent condition. I discovered on this visit that the fan house had been built as contemplated and the fan set, and while only running at a speed of 40 revolutions per minute, was passing double the amount of air through the mine that is required by the law. This volume was divided into four separate currents, the main currents were traveling from the bottom of the down-cast over the east and west entries to their terminus where it was divided to the north and south entries, the currents from the north returning to the up-cast over air crossings, giving very satisfactory results. I visited the mine again on the 6th of June, 1901, and made another careful inspection which resulted very satisfactory. The ventilation was found strong and fresh at every point, and the mine generally in good condition. I discovered all the entries high and clean, and the mine practically operated and well managed. I made another inspection of this mine on the 18th of October, 1901, and found it in excellent condition, with the ventilation fully up to the law. All the entries are high and clean, with good roadways. Coal about 34 inches thick, and worked on the treble entry system, or in other words an aircourse is carried on one side of the entry and a smoke room on the other side which is equivalent to an aircourse on each side and a very practical method it is, too, where so much powder is used. About 100 men and boys employed; 65 cents per ton is paid for mining mine run coal. Product shipped over the Missouri Pacific Railway.

Hall & Fletcher Coal Co.—Mine located one mile northwest of Minden, and has shipping connection with the Mo. P. R .R. by a spur switch extending from the main track. The mine is entered by a slope, and the product is taken out by machinery. Ventilation is produced by the aid of a furnace which was giving good results at dates of inspection. The coal is about three feet in thickness and worked on the double entry room and pillar plan. Mining is paid for at the rate of 65 cents per ton for unscreened coal. Employment is given to 30 hands. The coal is shipped over the Mo. P. R. R.

Swigart & Sons are operating a mine one mile north of Minden to supply home trade. Shaft 30 feet deep; operated by horse power. Ventilation is furnished by a small fire basket. Coal 32 inches thick, and worked on the double entry room and pillar plan. From 8 to 10 men employed during the winter. The coal is taken away in wagons and used in the surrounding country, but some is loaded on cars and shipped over the Mo. P. R. R.

Josiah Short is operating a mine west of Minden. Mine entered by a slope and ventilated by a furnace. Thickness of coal and mode of working are the same as that of other mines in that vicinity, and price paid for mining the same. The coal is hauled away in wagons, loaded on cars and shipped over the K. C., Ft. S. & M. R. R.

There is a large amount of coal taken out in the surroundings of Minden by stripping, as the covering is too shallow for underground mining. The coal will average nearly three feet in thickness, and is of very fine quality for both steam and domestic purposes.

Pittsburg, Kansas, Postoffice.

Wear Coal Co.,, Archie Kirkwood, manager; Chas. Duncan, superintendent; James Turner, foreman. Mine located at Vernon Station. This is a mining camp situated about two miles northwest of Minden, on the line of the Kansas City, Fort Scott & Memphis Railroad, and about a mile from the Kansas line. It consists of about 75 good houses for the miners to live in—most of them having three and some four rooms; also, a supply store, express and a postoffice; the camp is located in a very fine country. Shaft 47 feet deep, equipped with very good machinery. Ventilation is secured by a 10-foot fan, running at a speed of 110 revolutions per minute and passing a large volume of air in same time, but the airways being small and contracted considerable of the current was found returning to the up-cast before reaching the working faces. I made a careful inspection of this mine on the 14th of November, 1900, and found the ventilation better than on my former visit. I discovered that a new air shaft had been sunk on the 4th north entry on the east side, and was used as a down-cast which added greatly to the volume of air, and made it stronger and fresher. I also found that another air shaft had been sunk on the 5th north off of west side which was also used as a downcast, thus making the air better all over the mine except in the straight west entry where I found the air deficient in quantity as well as in quality at this date. On the 6th of June, 1901, I visited the mine again and found it satisfactory at every point, and the mine otherwise in a very fair condition. The covering over the coal being shallow, caves and falls occur here during the spring and wet seasons, letting a large quantity of water into the mine, which does considerable damage by blocking up the passage along the airways; but the water is easily handled by pumps, and the roads are kept comfortably dry. The management is doing everything in its power to operate the mine in full compliance with the requirements of the mining law. I made another thorough inspection on the 18th of October, 1901, and found the ventilation satisfactory and the mine otherwise in very fair condition. I discovered on this visit that the first four cross entries on the north and south on each side of the shaft had been worked out and abandoned, and the work confined at this date to the 5th, 6th, 7th north, and 5th, 6th, 7th south cross entries on *each side of* the shaft, and that the ventilative volume of air was conducted *first to these* entries and direct to the men, thus making the air stronger and fresher. About 100 men employed. Coal 3 feet thick, and worked on the double entry room and pillar plan, paying 65 cents per ton for mining.

The Wear Coal Company is now operating another large mine in this county, which is equipped with all the modern improvements and has one of the most practically constructed plants in the State. It is known as Mine No. 10, and operated under the same management as the other mines of this company. Jno. Kirkwood, foreman. It is located one mile west of Minden, and has shipping connection with the Mo. P. R. R. by a spur switch extending from the main track to the mine. The shaft is 40 feet deep and the hoisting is done by a pair of Litchfield engines, with twin cylinders 16x30 inches, connected direct to a 4-foot drum with steam break, working on first motion. Steam is supplied by two boilers of the O'Leary Durie type, 18 feet long and 60 inches in diameter, containing 44 4-inch tubes in each, and all built on solid rock foundation. The engine and boilers are under the same roof. A commodious and convenient building 52 feet by 64 feet. Each compartment is divided by proper partitions, the engine room is 24 feet by 24 feet, being entirely separated from the boiler room. The head gear is 54 feet high from the ground to the pulley wheels, and 32 feet from the top of rail to the landing, and the head house is 28 feet wide by 50 feet long. The coal is discharged from a self dumping cage to a hopper, and weighed in a hopper scale, after which it is delivered to a shaker screen, which screen grades the coal into three different grades or sizes, and different tracks are provided for each grade. The shaker screen is constructed from the latest pattern, works on a pendulum motion on an elevation of about 18 degrees, and is operated by an independent engine of 10 horse-power. The tipple rests on the head gear posts, and the screening arrangements rests on a solid rock foundation. The weighhouse and automatic appliances for the speedy, convenient and economical weighing and handling of a large tonnage of coal, are models of neatness and usefulness. A blacksmithshop is also provided for at this mine 24 feet wide by 40 feet long, equipped with steam drill press, cutter, power punch, forges and all tools necessary to make new and repair pit cars and to do all necessary work to keep up the repairs about the mine. Both shafts were sunk at the same time. The hoisting shaft is 8 feet wide by 15½ feet long, clear of timber, curbed by 4-inch thick lumber and partitioned into cageways. The escapement or fan shaft is located 80 feet northeast of hoisting shaft and is divided into two compartments, one of which for the air passage proper is 6x8 feet, and a stairway is constructed in the other. Besides this escape shaft, the mine has two other manway shafts, one 900 feet east of the hoisting shaft and one the same distance on the west side, and a commodious stairway with 7 landings built at each. The fan is set back 20 feet from the air shaft and connected by a tunnel extending from the fan to the air shaft, and trap doors are placed over shaft so that in case of a windy shot or an explosion these doors or shutters will be blown off without injuring the fan and could be readily replaced so that the ventilating current can be quickly restored to the mine. The fan is 14 feet in diameter and operated by a 10x12-inch cylinder horizontal engine connected direct to the fan shaft. The fan house and casings are so arranged and constructed as to allow the fan to force or exhaust as the requirements of the mine may be. The mine is operated on the double entry room and pillar plan, and at a short distance from the bottom of the air shaft an over-cast is erected over the main entry, thereby making it possible to ventilate each quarter of the mine with a fresh current of air, or in other words, the ventilative volume is divided into four distinct and separate currents. At date of inspection I noticed, judging from the plan on which the mine had been started, that all entries and air-courses are so constructed that in the event that it should become necessary to ventilate either pair of cross entries separately it can readily be done. The mine as planned, equipped and operated, together with the push, energy, wise and practical supervision which its ample provisions demand, and receive, it will soon become a great factor in the coal production of Barton county I made a thorough inspection of the mine on the 18th of October and found everything very satisfactory. The airways are high, wide and clean, leaving plenty of area for a large volume of air to pass through them at a moderate speed. I also noticed the pit bottom had been well secured by the use of large substantial timbers well lined, practically set and about 8 feet high near the shaft. Double track was laid on the east for about 200 feet from the shaft bottom, and some distance on the west side, and it is the intention of the company to extend the double parting further, so that one driver can pass in with his trip without coming in contact with the other driver with his trip coming in the opposite direction; the avoidance of such delays, it will readily be seen, will largely increase the output of the mine. The sinking of shaft, building of switch, and construction of the equipment was begun in March, 1901, and at the close of the year December 31st, the mine had an output of 500 tons per day and increasing daily as the development progresses, and by the time this report reaches its readers, judging by its present advances, the mine will be producing one thousand tons of coal per day.

The company has built 42 houses on the west side of Minden, a distance of about ¾ of a mile from the mine for the accommodation and *home of the miner.* The houses are all new, containing 2, 3 and 4 rooms. Fifteen of these house are built on the cottage plan and have three rooms to the house, which are ceiled. Fifteen have been built square, have 4 rooms to the house, which are all plastered and well finished, and 12 are 2-room houses to suit small families, these are also plastered and put up in good shape. All the houses are painted in light color with doors and casings paneled off with very neat and suitable trimmings, making the appearance bright and cheerful. From a sense of appreciation for the very decided improvements made lately by large coal companies throughout the State in the opening of new mines, there is nothing more deserving of praise and commendation than the neat commodious houses built for the home of the miners. Your Inspector having spent 60 years of his life in the mines, and lived the life of a miner for the same length of time naturally enjoys a real pleasure when he discovers large coal companies like the Wear Coal Company evidencing as it does such kind consideration for the feelings, comfort and happiness of the miner as is substantially attested by the neat homes, the accommodation and conveniences that have been furnished the miners by this and other companies in this State during the past year. Comparing the neatness and home like appearance of the houses now constructed for the home of the miner with those furnished them a few years back, we congratulate the miners on the vastly changed conditions for their comfort in this respect.

BATES COUNTY.

(Production, 372,218 tons.)

Bates county ranks fourth on the list of the coal producing counties, with an output of 372,218 tons of coal for the year just closed. The above amount is the product of 33 mines, employing on an average of 571 men and boys in and around the mines. The average price received at the mines per ton for coal was $1.04, and the total proceeds from the sale of the product amounts to $386,560. Powder during the year cost the miners $33,448, there having been 17,363 kegs consumed. The product is shipped to market over the Mo. P. R. R. Following is a decsription of the more important mines and their condition at dates of inspection:

Foster Post Office.

The coal in the surroundings of Foster is like that at Amsterdam, Amoret and Worland, about 3 feet in thickness, with very shallow covering, making underground mining impractical as well as unprofitable, and a large amount of coal is taken out here from strip pits, hauled from the mines in wagons, loaded on cars and shipped over the Missouri Pacific railroad. All information concerning these mines will be found in the statistical table.

W. H. Mace operates the Darby Hill mine, located about two miles west of Foster. Mine entered by a slope and ventilated by a furnace. Coal 3 feet thick and worked on the room and pillar plan. Employment is given to 10 men. Coal hauled over a tram road to Rucker switch, loaded on cars and shipped over the Mo. P. R. R.

There are other mines operated in this locality on a small scale during winter season. These mines have drift openings entered from the bottom of strip pits after the covering gets too thick to strip.

Hume Post Office.

There are a large number of strip pits operated in the surroundings of Hume and the coal is shipped to market over the P. & G. R. R. Coal about 3 feet thick and of very good quality; it finds a ready market wherever once used.

Rich Hill Post Office.

Thos. Ingles operates a mine at Rich Hill in the fall and winter for local consumption.

Vernon Coal Co. I. M. Wise, Superintendent; Sid Haynes, Foreman. Mine located two miles south of Rich Hill, and has shipping connection with the Missouri Pacific railroad by a spur switch extending from the main track. Shaft 108 feet deep; equipped with very good machinery for hoisting. I visited the mine on the 13th of November, 1900, and found the ventilation very weak on the east side and mixed with black damp and impure air, which was coming from the old abandoned slope where a connection had previously been made. The ventilation at this date was furnished by a fan, and the same was set on the top of the air chamber, which was partitioned off at one end of hoisting shaft, and instructions were given to the company to sink an escapement shaft at once. I made another inspection on the 5th of June and found the mine in good condition. I discovered that the escapement shaft had been sunk and the fan removed and a stairway erected. The ventilation was up to the requirements of the law and fully satisfactory on this visit. I made another inspection on the 14th of October, 1901, and found the ventilation and general condition of the mine very satisfactory. Coal about 42 inches thick and worked on the double entry room and pillar plan. Employment is given to about 60 men, and 60 cents per ton is paid for mining unscreened coal.

David Rees is operating the old slope near Gulf No. 5 and shipping the coal over the Mo. P. R. R. The mine is practically worked out, but few stumps and pillars left which are now about all taken out and the mine abandoned.

W. H. Lowder operates a mine 4 miles north of Rich Hill and has shipping connection with the Mo. P. R. R. by a spur switch. Mine entered by a slope and ventilated by a furnace, giving very fair results. Coal four feet thick and worked on the double entry room and pillar plan. From 6 to 12 men employed.

Denayer Bros. are operating a mine north of Rich Hill. Mine entered by a slope. Coal 4 feet thick and worked on the room and pillar plan. From 4 to 7 men employed.

N. Bellier operates a mine north of Rich Hill and ships the product over the Mo. P. R. R. Thickness of coal and mode of mining is the same at this mine as that of the last mentioned. These are mines that have been reopened in order to work out stumps and pillars left in when the mines were abandoned.

Robert Pearson. Mine located 4 miles north of Rich Hill, and has shipping connections with the Missouri Pacific railway by a spur switch. Mine entered by a slope and ventilated by a furnace with very fair results. I made the first inspection of this mine on the 13th of November, 1900, and found it in a healthy condition, with the ventilation satisfactory. On the 4th of June, 1901, I visited the mine again and found that considerable more work had been opened out since my last visit and discovered the air weak at the face of the workings. This mine having been driven along side of a mine which had been worked out and abandoned, the miners would occasionally strike through a pillar and into the old works, when this was the case the foul air from the old mine would enter and vitiate the air, and as the furnace was small and inadequate to contend with conditions like this without causing discomfort to the miners, we advised Mr. Pearson to replace the furnace with a fan.

On the 15th of October I visited the mine again and found its condition fully satisfactory. I discovered that portion of the mine where the air was foul and deficient on a former visit had been abandoned, thus making the ventilative current stronger and fresher. Coal 4 feet thick and worked on the room and pillar plan. About 40 men employed. Product shipped over the Mo. P. R. R.

Rich Hill Coal & Mining Co. R. M. McDowell, General Manager; W. B. Williams, General Superintendent. This company owns and is operating several mines in the surroundings of Rich Hill, all of which have shipping connection with the Missouri Pacific railway.

Mine No. 15. William Gresham, Foreman. Mine located one and one-half miles south of Rich Hill, and has shipping connections with the

Mo. P. R. R. by a spur switch extending from the main track. Shaft 106 feet deep; equipped with first class machinery for hoisting. Ventilation is furnished by a 15-foot fan, running at a speed of about 80 revolutions per minute and removing enough air to ventilate the mine satisfactory. This is the largest producer and the most practically operated mine in the State. I made four inspections of this mine since my last report and on every visit found the ventilation above the requirements of the law—the mine in good sanitary condition, and the safety of the employes well guarded. I made the first inspection on the 13th of November, 1900, and found the mine in good condition. A new air shaft had been sunk on the south side and was used as a down cast.

The air is now coming down through the new air shaft and travels to the face of the south entry, where it is divided to the east and west sides, the current from the west side returning to up cast over an air crossing. The route of the air is thus shortened about 4,000 feet, and the current is directed straight from the down cast to the face of the workings, making it stronger and fresher, and very satisfactory. All the work on the north side is branched off from the straight east, and another air shaft has been sunk at its terminus, which is also used as a down cast, and permits the ventilative volume of air to go direct from the bottom of the air shaft to working places of the miners in a very satisfactory manner, making 3 separate currents of air on each side of the shaft. At date of my next visit in March, 1901, I found the ventilation satisfactory and the mine in excellent condition. An electric motor had been put in to haul the coal out on the north side and an electric pump was put inside the mine to pump out the water, which was movable and could be taken from one place to another as the requirements of the mine demanded. A bore hole was put down to discharge the water and connection could easily be made with the pump at every pump hole, and in this manner the roadways were constantly dry. I made another inspection on the 5th of June, 1901, and found the ventilation, as well as the general condition of the mine, fully satisfactory.

I made my fourth visit on the 15th of October, 1901, and found every requirement of the mining law referring to the management of mines fully complied with, and the mine in excellent condition. Another electric motor has been added to the equipment of this mine to haul out the product. Coal 4 feet thick and worked on the double entry room and pillar plan; 55 cents per ton is paid for mining mine run coal. From 250 to 275 men and boys employed. Product shipped to market over Missouri Pacific railroad.

Mine No. 20. Jas. Price, Foreman. Mine located 6 miles northwest of Rich Hill and has shipping connections with the Mo. P. R. R. Water broke into this mine during the heavy rains in the fall of 1900 and filled it up. The mine being nearly worked out the company decided to abandon it, and commenced to open another mine a half a mile west called mine No. 22, but as the coal proved low and faulty it was also abandoned after getting out what coal was workable.

BOONE COUNTY.

(Production, 21,549 tons.)

Boone county is nearly all underlaid by the coal measure formation, and mining operation are carried on in a small way in different parts of the county. The same seam of coal underlies this county as that so extensively worked in Macon and Randolph counties, and the vein can be found in every township in the county, but the output of the mines is limited to the local demand. Following is a description of some of the larger mines:

Columbia Post Office.

Blackfoot Coal Co. Jas. Hubbard, Foreman. Mine located 5 miles northwest of Columbia on the gravel road. Shaft 120 feet deep: operated by horse power. Ventilation is furnished by a furnace with very fair results. The communication between the two shafts was found so obstructed as to be impassible to go through in case of accident to hoisting shaft, and instructions were given to the company to have same cleaned.

The coal is forty-four inches thick and worked o nthe room and pillar plan. This could be made an extensive mine if it had railroad connection to ship the product to other markets, but being located 5 miles from a railroad, its output is limited and confined to local demand. Employment is given to about 15 men in winter and 5 in summer. The coal is hauled away in wagons to Columbia, where it is consumed.

The Carter Bros. Coal Co. This mine is located four and one-half miles northwest of Columbia. and is entered through a vertical shaft 85 feet deep, which is equipped with horse power apparatus for hoisting. Ventilation is furnished by the aid of a furnace with poor results. I visited the mine on the 4th of October, 1900, and found the air deficient owing to the airways being choked up and I ordered the same cleaned out and made larger at once. On my next visit to the mine I found it closed down and abandoned.

Prayther & Co. are operating a mine near the Carter mine. It is entered by a slope and ventilated by a small furnace. Coal 40 inches thick and worked on the room and pillar plan; 14 men employed in winter and 5 in summer; product consumed at Columbia.

Columbia Coal Co. R. E. Henry, Manager. Mine located at Henry station, and has shipping connection with the Columbia branch of the Wabash R. R. Shaft 112 feet deep, and operated by steam power. Ventilation is furnished by a furnace which was giving very fair results at dates of inspection. I visited the mine on the 4th of October, 1900, and discovered that a new air-course had been made on the north side, which greatly improved the ventilation; the system of working had been changed from the longwall to the room and pillar plan, and the mine was found at this date in a very fair condition; two more inspections were made during the year with satisfactory results. Coal 40 inches thick and worked on the room and pillar plan; 75 cents per ton is paid for mining. From 12 to 15 men employed; the product is consumed at the water-works at Columbia.

S. D. Gordon. Mine located one mile east of Columbia. Shaft 55 feet deep; hoisting by horse power. Ventilation is secured by the aid of a furnace with very fair results. Coal is hauled away from the mine in wagons to Columbia, where it is consumed mostly to supply the water-works. The seam is about 30 inches thick and is worked on the room and pillar plan. Employment is given to 10 men in winter and 5 in summer; pay for mining, 75 cents per ton. The mine is now abandoned.

I. Gray operates a drift mine, near the Carter mine, during the fall and winter to supply local demand.

Wm. Prather operates a mine northwest of Columbia during the winter season to supply home trade. Mine is entered by a drift and the coal worked on the room and pillar plan. It is hauled away from the mine in wagons and consumed at Columbia.

Harrisburg Post Office.

A large amount of coal is taken out every year in the surroundings of Harrisburg. In fact the country is all underlaid with a 4-foot seam of coal and every farmer in that locality who has a low ravine or a creek running through his farm, has also a coal mine. The coal crops out at all low places and the farmers get their coal by stripping it until the cover gets too thick, when a drift is driven under the hill, and in this way a large amount of coal is mined every fall and winter. The coal seam running through this place is a continuation of the seam that is so extensively mined in Randolph county, and productive mines could be profitably operated here if it had railroad connection to ship the product to market, but located as it is, about 12 miles from a railroad, the output of coal in this neighborhood will be very small indeed until better facilities is offered to take it to other markets. The names and output of every mine, with other information, will be found in the statistical table of this county.

Rucker Post Office.

H. T. Buckler operates a mine at Rucker in the fall and winter to supply home demand. The mine is entered by a drift and ventilated by a furnace. Coal 4 feet thick and worked on the room and pillar plan. Employment is given to 6 men in winter, and the coal is consumed in the surrounding country.

I. H. White is operating a mine in same locality. Mine entered by a drift. Ventilated by a small furnace, and worked on the room and pillar plan. Coal consumed in the surrounding vicinity.

The country in the vicinity of Rucker is all underlaid with coal. The seam is about four feet thick and of good quality for both steam and domestic purposes and extensive mines could be operated if there were better shipping facilities to take the coal to market; but the black diamond will have to remain, in its present abode until the capitalist see fit to build a railroad to the coal belt and develope it.

CALDWELL COUNTY.

(Production, 19,021 tons.)

Caldwell county stands eighteenth in rank in the production of coal in this report and has the distinction of being the deepest mine in the State. Since the last report was issued 19,021 tons of coal were produced and sold for $34.515, or an average of $1.81 per ton. Two mines are now operated in the county, and the location and condition of each is as follows:

Hamilton Post Office.

Caldwell Coal Co. E. B. Hayden, President; Wm. Toney, Foreman. Mine located two miles east of Hamilton, and has shipping connection with the Hannibal & St. Joe R. R. by a switch. Shaft 507 feet deep; operated by machinery for hoisting. The ventilation is furnished by a 10-foot fan, and the ventilative volume is divided into four separate currents, two currents on each side of the shaft. I made a careful inspection of this mine on the 25th of September, 1900, and found it in a very fair condition. The ventilation was satisfactory and the safety appliances were found in a safe condition and in good repair. The communication to the escape shaft was found also in good order, high, wide and clean.

On the 30th of April, 1901, I made another careful examination of the mine and found the ventilation on the south side in a satisfactory condition, but deficiency in the air was found on the second south entry off first east on the north side. In fact the air-course was entirely choked up and no air was passing and instruction was given to the management to have them cleaned at once. With this exception the general condition of the mine was very fair. I visited this mine again on the 4th day of November, 1901, and found it idle, the men having some trouble and were on strike, hence no inspection was made. I returned again on the 2nd of December, 1901, and found that the strike was still on, but discovered that about 30 men were at work in the mine. I made a thorough inspectionat this date and found it in a worse condition than on former inspection and clearly showed great neglect. The ventilative volume was strong and satisfactory at the points where the few men were working, but I disered the air entirely cut off at other parts that remained idle and it will rerequire considerable cleaning up to put the mine in a healthy condition. Coal 18 inches thick and worked on the longwall plan. Mining is paid for at the rate of $1.10 per ton. The coal is of extra good quality for all purposes, but more especially that of steam. It makes a very hot fire and is noted for its durability. The vein being thin is naturally expensive to operate, and as it comes in contact with the larger seams in the market, it is difficult to operate the mine profitably.

Kingston Post Office.

Dripping Springs Coal Co. A. Bishop, Manager. Mine located one mile north of Kingston and has shipping connection with the Kingston branch. Shaft 248 feet deep, and equipped with good machinery for hoisting. Ventilation is furnished by a steam jet, with very fair results at present, as only a few men work in the mine. I visited it 3 times during the year and found the ventilation and the general condition fully satisfactory. The mine is now operated on the upper vein, which is very irregular and faulty, dwindling down almost to nothing in thickness, which makes it expensive to operate and we expect the company to abandon it in the near future and work the lower vein 130 feet below. The shaft is already sunk to it. John Stewart, Foreman.

CALLAWAY COUNTY.

Callaway county, like Boone, is situated on the eastern margin of the coal formation and coal has been found and mined in nearly every township in the county, but only on a small scale. The same vein is worked here as that so extensively mined in Macon and Randolph counties, but runs low and more irregular than the last named counties and crops out in low places. The principal mine, and the only one in the county having shipping connection is located at Fulton. Following is a description and location of mines operated in this county:

Fulton Post Office.

Wm. Castle operates a mine near Fulton. Mine entered by a drift and ventilated by a furnace. Coal 28 inches thick and worked on the longwall plan. The product is consumed at Fulton.

Fulton Fire Brick & Mining Co. L. V. Nichols, Manager; I. Harris, Foreman. Mine located two miles south of Fulton and has shipping connection with the Mexico & Cedar City branch of the Chicago & Alton R. R. Shaft 100 feet deep, and operated by steam power. Ventilation is secured by a small fan with very fair results. I made a careful inspection of this mine on the 3rd of October, 1900, and found it in a very rickety condition in the matter of safety. The recurbing of the shaft as was contemplated was not satisfactory, as portions of it had not been touched and was found in a dangerous coundition. Cages were found without bonnets or catches, and one of the hoisting ropes was in bad condition, and instruction was given to the company to recurb the shaft where needed, put covers and catches on cages, and replace the defective rope with a new one at once. On my next visit to the mine I found it idle, and no one around it no inspection could be made. On the 21st of November, 1901, I visited the mine again and found it in a very dangerous condition, the curbing rotten and bulging out into the shaft, preventing the cages from running and the following letter was sent to the company, which explains fully the condition of the mine at this visit, with instructions from this department:

Jefferson City Nov. 25th, 1901.

Fulton Fire Brick Manufacturing and Mining Co., Fulton, Mo.:

Gentlemen—After a careful investigation and inspection of your mine made on the 21st day of this month, I confess to being sorry that my duty compels me to inform you that I found it in an extremely dangerous condition and indeed so much so as to make it unsafe for the passage of men up and down the shaft.

To begin with, the curbing in the shaft is rotten and broken in several places; it is out of alignment and sprung to such an extent as to cause the cages to rub nearly all the way from top to bottom. The astonishing thing to me is—that you do not appear to appreciate the calamity you are inviting by your indifference to a condition of things that must be apparent to the most superficial observer. The extraction of the material in your clay mine, which underlies your coal, has already caused a movement of the superincumbent material plainly to be seen to the very surface of the ground, causing a squeeze so pronounced that your shaft is thrown in a twist and your pit-head made to settle. I noticed also during this same inspection, that you are now at work in the clay mine, reopening one of the entries and taking out timber. This, in my judgment, will start the squeeze anew, and to add still further to the dangerous condition of things you have started another opening in the clay running toward the railroad and quite close to the shaft. The timber in the bottom and also at both the coal and clay openings in the shaft has already been twisted all out of shape and the least movement of the material is liable to produce a cave-in. *For these reasons I am compelled to order your mine closed until the shaft is made perfectly safe for your employes to pass to and from work.*

The patching of a few places here and there will not warrant that safety required and demanded by existing conditions, and I shall have to insist upon strong timbers and a substantial re-timbering of your shaft form top to bottom at once.

I noticed that there were about 22 men employed in your coal and clay and at the time regarded the conditions as jutifying me in closing the mine and ordering the men out and to stay out until the shaft was made safe; now that I have taken time to calmly and duly consider all the interests involved, I feel that I cannot longer reconcile my sense of duty with the thought of delaying the order relative to the closing of your mine.

I also noticed that you have in violation of the law been operating your cages without safety catches. When I call to mind the long experience of your management in mining, realizing the fact that you have the required knowledge of what is demanded and then observe the wilful, and reckless disregard displayed not only with reference to the welfare of your employes, but to the laws of the State as well, I confess that I am astonished and pained. I expect you to at once comply fully with these instructions and oblige,

Yours truly, CHAS. EVANS,
State Mine Inspector.

In a few days after the receipt of the above letter the company kindly notified this department that they had secured lumber and were working night and day recurbing the shaft in order to make it secure, but we have not been able to visit the mine again up to the present writing. Coal 30 inches thick and worked on the longwall plan. The product is mostly consumed by the company in the manufacture of bricks, locomotive blocks and other articles, but some of the coal is used in the city and surrounding country.

Delphus Holmes operates a mine southwest of Fulton. Shaft 45 feet deep and operated by horse power. Coal 26 inches thick and worked on the longwall plan. The product is taken away in wagons and consumed at Fulton and vicinity.

James Smith is operating a mine southeast of Fulton across the creek. Mine entered by a drift and ventilated by a furnace. Coal 30 inches thick and worked on the longwall plan. Mining is paid for at the rate of $1 per ton, and from 8 to 10 men employed. Coal consumed at Fulton.

R. Thorpe is operating a drift mine near Fulton and the coal consumed in the vicinity.

John Harris operates a mine southeast of Fulton on the Jefferson City road. Shaft 40 feet deep, and operated by horse power. Ventilation is furnished by a furnace with very fair results. Coal 30 inches thick and worked on the longwall plan. This is the most extensive mine in this locality; employment is given to 20 men in winter. The coal is taken away from the mine in wagons and consumed at Fulton and vicinity, most of which is used at the State institutions.

Chris Lambis is operating a drift mine on Ed Curd's land. Mine only worked during the winter to supply home demand.

Woods & White operates a mine in the same locality. Mine entered by a slope and ventilated by a small furnace. Coal 30 inches thick and worked on the longwall plan; from 4 to 6 men employed.

John Marsenkoff operates a mine on the Curd land. Shaft 25 feet deep, and hoisting by horse power. Thickness of coal and mode of working the same as at other mines. Mine only operated in winter and the coal used in the neighborhood.

Jas Simmons is operating a mine on the Powells land, and the product is consumed in the surrounding country.

I. Bishop operates a mine near Fulton during the winter season. Mine entered by a drift. Coal 30 inches thick. The product is consumed in the immediate vicinity.

There are several other mines operated at various points throughout the county during the cold weather to supply home demand, which we did not have the time or opportunity to visit, and as they are only employing from 2 to 4 men they don't come under the provisions of the law for inspection.

CARROLL COUNTY.

(Production, 1,430 tons.)

Very little mining has thus far been carried on in Carroll county, notwithstanding the entire county is underlaid by the coal measure formation. The mines which are operated in this county are on a small scale to supply home trade. The top seam is mined here, which is only about 18 inches in thickness and quite a number of the mines are strip pits.

The names of all these parties, with other information, will be found in the statistical table of this county.

CASS COUNTY.

Creighton Coal Co. Geo. Meidinger, Manager. Mine located at Creighton. A tram road is built from the mine to the railroad a distance of half a mile, thus making shipping connections with the K. C., Ft. Scott & Memphis R. R. Shaft 156 feet deep and operated by steam power. I visited the mine on the 13th of December, 1900, and found it idle in obedience to the instruction of the mine inspector. Demand was made of the company to comply with the law that provides for escape shafts to be sunk as an avenue of escape for the employes in case of a fire or any other accident to hoisting shaft. The mine has been in operation for six years and every effort has been made by the inspector to get the company to comply with the law but failed and was compelled to order the mine closed until an escape shaft is sunk. It is as strange as it is true that while the law providing for escape shafts is one of the best laws on the statute books and yet when the inspector in the execution of his official duties, attempts to get mine operators to comply with this law, he finds the miners who are the direct beneficiaries of the law taking sides with the operators and opposing the inspector in his honest efforts to secure their greatest safety. When I ordered this mine closed after all efforts failed to get the company to sink the escapement shaft, the employes of the mine sent several petitions to the inspector and one to the Governor asking permission to operate the mine without an escape shaft, and in direct violation of our laws. Miners should be consistent and take advantage of every benefit our laws give them, as there never will be too many safeguards thrown around the miner in his dangerous work.

CEDAR COUNTY.

(Production, 1,730 tons.)

There are several parties operating mines in the vicinity of Jerico, El Dorado Springs, LeBeck and at other parts of the county. The coal is found in local deposits in the hills, and the mines are entered by drifts and slopes. The coal is about 24 inches in thickness and worked on the room and pillar plan. The product of the mines is carried away in wagons and consumed in the neighborhood.

Jerico Post Office.

A. S. Miner sunk a shaft on his land last summer and struck coal at *a depth of 22 feet*, and is operating the mine by horse power for hoisting. *Mine only worked* in winter.

G. M. Poage operates a drift mine during the winter to supply home trade.

I. C. Duncan is operating the same mine that he did last year, and the coal consumed at home.

Howard & Lunchford operate a mine near Jerico in the fall and winter to supply home consumption.

W. Packerd, A. C. Davis and David Barik are operating mines in the neighborhood of Jerico, and the product is consumed in the vicinity.

The coal taken out in the surroundings of LeBeck and El Dorado Springs is obtained by stripping and consumed in the immediate vicinity.

CHARITON COUNTY.

(Production, 1,447 tons.)

While the whole of Chariton county is underlaid by the coal measure formation, yet, like Carroll, the adjoining county, very little mining is carried on. The mines that have been operated during the past year are only worked upon a very small scale to supply local demand during the winter season.

The mines producing the most coal are located near Keytesville and Salisbury and are operated by F. P. Buffington and Henry Wachter, respectively. The coal at Salisbury is 42 inches in thickness, while at Keytesville, Guthridge Mills, Indian Grove and Newcomer, it is only about 18 inches.

CLAY COUNTY.

(Production, 16,681 tons.)

Missouri City Coal Co. H. Jones, Manager; Wm. Main, Foreman. Mine located at Missouri City, and has shipping connection with the Wabash R. R. by a switch. Shaft 165 feet deep and equipped with very fair machinery for hoisting. Ventilation is produced by a 10-foot fan with excellent results. I visited the mine in October, 1900, and learned that Mr. Harrison Jones had bought the mine and was making preparations to commence operation, and had already made considerable changes on the pit top. I made an inspection of the inside workings and discovered that a new door had been set on the north entry, which was turning the air and conducting it around the work very satisfactory. On the 29th of March I visited the mine again and made another inspection and found it in a very fair condition, with the ventilation fully up to the requirements of the law. I discovered on this visit that too much dirt was thrown into the air-course on the east side and ordered it cleaned. Instruction was also given to the company to examine and repair stairway in escape shaft and connect a hose to the pump ready in case of fire at pit top or engine house. I made another inspection on the 14th of September and found that the air-course on the east side had been cleaned and enlarged, leaving plenty of area for the air to travel and all other instructions given at a former visit had been complied with. Coal 20 inches thick and worked on the longwall plan. The coal is taken to Kansas City. Employment is given to 40 men.

DADE COUNTY.

(Production, 5,393 tons.)

Mining has been carried on in Dade county for a great number of years, but only on a limited scale to supply the home demand. The coal measures of this county occur only in the northwestern corner, where they are confined almost exclusively to one or two townships. The coal is found in local deposits in the hill tops and ridges, and the mines are entered by drifts. It will average about 30 inches in thickness and is of excellent quality. The mines are located 12 miles distant from a railroad and the coal is taken away in wagons and consumed in the surrounding country.

Sylvania Post Office.

Finney & Simmons operate a mine on the land of McElhany during the winter season to supply home trade.

O. Ramsey is operating a mine on the land of Rob't McClvey. Mine entered by a drift. Coal 30 inches thick and worked on the room and pillar plan.

Thos. Gardner operates a mine on the McCombs land. Drift opening and ventilated by a small furnace. Coal consumed in the locality.

Leonard & Hendricks are operating on the land of J. Johnson. There are several others operating in this neighborhood, and their names, with other information concerning same will be found in the statistical table of Dade county.

GRUNDY COUNTY.

(Production, 42,361 tons.)

Grundy County Coal Co. Rob't Aladise, Superintendent. Mine located one mile south of Trenton and has shipping connection with the Chicago, Rock Island & Pacific railroad by a switch extending from the main track. Shaft 170 feet deep and operated by first class machinery.

The ventilation is furnished by a 10-foot fan with satisfactory results. I made a careful inspection of this mine on the 30th of November, 1900. and found it in excellent condition, with the ventilation good all over the mine and its general condition very satisfactory.

I visited the mine on the 12th of April, 1901, and found it in a satisfactory condition, with the ventilation good and all the safety appliance in a safe and good working order. The communication between the hoisting and escapement shafts was found high, wide and clean and in good condition, and the mine found safe and healthy. On the 30th of August. 1901, I made another careful inspection and found everything satisfactory, with the mine safe and healthy. Indeed the condition of this mine seems to be improving on every visit I make. Coal 18 inches thick and worked on the longwall plan. Employment is given to 150 men, and $1.15 per ton is paid for mining. The product is mostly consumed by the Chicago, R. I. & P. R. R., but a large amount is sold for home consumption.

HENRY COUNTY.

(Production, 103,267 tons.)

The entire county of Henry is underlaid with the coal measure formation. and coal is mined in all sections of the county, but a very large number of the mines are worked on a small scale, and only operated during the winter months to supply the home demand. There are reports from 29 mines represented in the statistical table from this county.

These 29 mines produced 103,267 tons of coal since the last report. which was sold at an average of $1.50 per ton at the mine with a total valuation of $154.385. In producing this amount of coal an average of 309 men were employed. Following is a description of some of the mines:

Brownington Post Office.

Cooper Creek Coal Co. Mine located half way between Brownington and Deepwater and has shipping connection with the Frisco R. R. by a spur switch. Shaft 20 feet deep and operated by horse power. Ventilation is produced by a furnace, with very good results. Coal 3 feet thick and worked on the room and pillar plan. The mine being surrounded by strip pits and the covering so shallow it makes a large amount of water, which is thrown out by an elevator pump. Employment is given to 30 men. The coal is of very good quality and is consumed at local towns along the line of the road.

John Thompson & Co. Mine located between Brownington and Deepwater, and has shipping connection with the Frisco R. R. by a spur switch. Shaft 58 feet deep, using steam power for hoisting. Ventilation is secured by a small fan which is set on the top of the hoisting shaft, exhausting through an air chamber partitioned off at one end of the shaft, with satisfactory results.

This mine makes a very large amount of water, being surrounded by strip pits. Coal 3 feet thick and worked on the room and pillar plan. Mining is paid for at the rate of 90 cents per ton for forked coal. From 30 to 35 men employed.

Clinton Post Office.

Jordan Coal & Coke Co. M. Sheldon, Manager. Mine located two miles south of North Station and has shipping connection with the Clinton branch of the K. C., Ft. S. & M. R. R. Shaft 30 feet deep and operated by horse power. This is a new mine opened during the past year, and at dates of inspection found 12, and 6 men, respectively, at work. Ventilation is furnished by a small furnace, and the mine being new, was giving saticfactory results. Coal 32 inches thick and worked on the room and pillar plan. Ninety cents per ton is paid for mining. Coal consumed at local towns along the line of road.

Jas. Dameron operates a mine southeast of Clinton during winter season to supply home trade.

Wm. England is operating a mine near Clinton to supply home consumption.

Watkins mine is located 3 miles southeast of Clinton. Shaft 35 feet deep and operated by horse power. Ventilation is produced by a small furnace, with very fair results. Coal 24 inches thick and worked on the room and pillar plan. Ninety cents per ton is paid for mining, and from 5 to 8 men employed. The coal is taken away in wagons and consumed at Clinton.

Dailey & Sons. Mine located 3 miles south of Clinton. Shaft 25 feet deep; operated by horse power. The mine is worked on the room and pillar plan, and ventilated by a small furnace. The coal is taken away in wagons and consumed at Clinton.

I. W. Watson is operating the Owen mine and the product is consumed at Clinton and vicinity.

Deepwater Post Office.

Densler & Hurst operate a mine south of Deepwater on the other side of Cooper creek. Mine entered by a slope, and ventilated by a furnace. Coal 3 feet thick and worked on the room and pillar plan. Coal taken away in wagons, loaded on cars at Eaton switch and shipped over the *Clinton branch of the* K. C., Ft. S. & M. R. R.

Hurst & Sheldon. Mine located between Brownington and Deepwater. Shaft 50 feet deep and operated by horse power. Ventilation is furnished by a furnace. Thickness of coal and mode of working is the same as that of other mines in this locality. This mine has no shipping connection and the coal is taken from the mine in wagons and loaded on cars of the Frisco line and consumed along the road at local towns.

John L. Ingram operates a mine in same locality, and the product consumed in vicinity.

W. S. Dickey Clay Manufacturing & Mining Co.. Mine located at Deepwater. Slope opening and ventilation is furnished by a furnace with good results. I made 3 inspections of the mine during the year and found it in a healthy condition, and the safety appliances in good repair. On my visit on the 7th of June I discovered the coal ahead was going to the dip, making it expensive to haul it out, and the company contemplated sinking a shaft in the basin of the dip to save the expense of hauling up hill. On the 21st of October I visited this mine again and observed that a shaft had been sunk and equipped with machinery for hoisting, but no underground connection made. Coal 3 feet thick. The product is all consumed by the manufacturing company. Sam Smith, Superintendent.

Wm. Rees, Jr., operates a mine 4 miles southeast of Deepwater, and has shipping connection with the Frisco railroad by a spur switch. Shaft 42 feet deep; hoisting by horse power. The mine is ventilated by a furnace, which was giving good results. Coal 34 inches thick and worked on the room and pillar plan. The coal is overlaid by a slate roof easily secured by timber. The mine is practically dry and in good condition; $1.00 per ton is paid for mining in winter and 90 cents in summer. Employment is given to about 20 men. The product is consumed at local towns along the line of road.

Wm. Rees, Sr., is operating a mine in the same locality to supply home trade. Thickness of coal and mode of working is the same as that of other mines in that neighborhood.

The Meranda mine is now operated by I. Hurst. Shaft 35 feet deep and operated by horse power. Ventilation is furnished by a small furnace. Coal 3 feet thick and worked on the room and pillar plan. Eight men employed in winter to supply home trade.

Smith Coal Co. Mine located in the brush and work the same seam of coal and on the same method as that of other mines in this locality.

Wm. Rusk is operating a mine in the brush on the same seam and under same conditions as the above mentioned mines. Employing a few men in winter to supply home trade.

There are several other parties stripping coal in the surroundings of Deepwater, and the product is consumed in the surrounding country.

Lewis Station Post Office.

Co-Operative Coal Co. Mine located at Lewis Station and has shipping connection with the M., K. & T. R. R. by a spur switch, extending from the main track. Shaft 75 feet deep and operated by machinery for hoising. The ventilation is furnished by a 10-foot fan with excellent results, and the mine was found very well provided with good air at both inspections. The present operator since he took charge of the mine has made great improvements. Airways have been cleaned, new doors set, and new roadways made, and the general condition of the mine is good. Coal 30 inches thick, and worked on the longwall plan. Eighty cents per ton is paid for mining in winter and 70 cents during summer months and from 30 to 40 men employed. The product is taken to Sedalia and other towns along the railroad, where it is consumed .

D. P. Pigg Coal Co. Mine located one and one-half miles northeast of Lewis Station, half a mile north of railroad. Drift opening and the ventilation secured by the aid of a furnace. The ventilative current enters the mine through one drift, circulates around the workings and returns along the other drift to the furnace, where it ascends after finishing its work with results entirely satisfactory. The mine was reopened during the past year, after laying idle for several years. A new tramroad was built from the mine to the railroad to secure shipping connection over the M., K. & T. R. R. Coal 30 inches thick and worked on the longwall plan. Eighty cents per ton is paid for mining in winter and 70 cents in summer. Employment is given to 30 men. The product is taken to Sedalia.

Tebo Coal Co. John Bowen, Superintendent. Mine located at Lewis Station and has shipping connection with the M., K. & T. R. R. by a switch. Shaft 35 feet deep and equipped with machinery for hoisting. The ventilation is furnished by a furnace and the mine is well ventilated. This is a new mine sunk and opened out in the fall of 1900, and at date of my second inspection, on the 8th of June, 1901, had 40 men employed. I made another inspection of this mine on the 22nd of October, 1901, and found it in good condition. Thirty men employed, paying 80 and 70 cents for mining alternatively in winter and summer. The product is consumed by the railroad company on their engines, chutes being erected at the mine to coal trains.

There are parties operating mines and taking out coal during the cold season at Appleton City, Montrose, Garland, Calhoun, Piper and Sparrow, and the names of all those parties, with other information concerning same will be found in the statistical table of this county.

Windsor Post Office.

C. W. Field operates a mine on the Chappel land located two miles north of Windsor. Coal 3½ feet thick and is obtained by stripping. It is taken away in wagons and consumed in the surrounding country.

W. E. Hughes operates a mine two miles south of Windsor. Mine entered by a vertical shaft and ventilated by a furnace. Coal 4½ feet in thickness and worked on the room and pillar plan. Mine only operated in winter and the product is consumed at home.

L. E. Beaman operates a mine on the Miller land, which is located 6 miles north of Windsor. Shaft 35 feet deep, using horse power for hoisting. Coal 5 feet thick and worked on the room and pillar plan.

This is a local deposit of coal. and we on several occasions in our annual report expressed our opinion that the deposit extended under a large area of the adjoining country and during the past few months the Tebo Coal company prospected the land fully and discovered that it extends 2,300 yards in length and 550 yards in width and will run from 4½ to 5 feet in thickness, and the above named coal company intends having a switch built out and work the coal.

The Hines mine is located in the same locality as the Miller mine and working the same coal deposit. The coal is of good quality, overlaid by hard slate roof, easily secured by timbering. In fact very little timber is used. While the covering is shallow and a large amount of coal is being worked out, the mine is practically dry and the roof standing as well now as when the coal was taken out 20 years ago.

HOWARD COUNTY.

(Production, 3,685 tons.)

A very large portion of Howard county is underlaid by a thick coal seam, but located as it is some distance away from the railroads, it is as yet undeveloped, and what mining is done here is on the upper seam, which only measures about 18 inches in thickness. The same vein extends under a portion of this county as that so extensively mined in Randolph county, and productive mines could be operated if convenient to shipping facilities, but the mineral wealth of Howard county must remain undeveloped until the capitalist build an iron road to take the product to market.

Fayette Post Office.

The Elkin mine is operated by W. R. Graham.

The Fayette coal mines are operated by R. L. Jackson.

The Lockridge mine is operated by Jas. Gray.

All these mines have drift openings ventilated by natural current, and worked on the room and pillar plan. The coal is 18 inches thick and is hauled away from the mines in wagons and consumed at Fayette and vicinity.

JACKSON COUNTY.

(Production, 20,000 tons.)

Brush Creek Coal Co. H. M. Holden, Manager; Jas. Dunkbery, Foreman. Mine located two miles southeast of the city limits of Kansas City, and has shipping connection with the Belt R. R. by a spur switch. Shaft 460 feet deep. Equipped with good machinery for hoisting. Ventilation is produced in a satisfactory manner by a 10-foot ventilating fan. The ventilative current is practically divided and conducted around the workings, keeping the mine clear of gas and other impurities and furnishing enough air in every part of the mine to keep it in a healthy conidtion. I made my first visit to this mine on the 7th of August, 1900, and found it idle, and no inspection was made. I returned on the 17th of September and made a thorough inspection and found that all the work at this date was confined to the north side, where I found about 50 men at work. I discovered that the ventilation was good all over the mine. Two tests of the air was taken, one on each side of the shaft at the return, and 21,575 cubic feet per minute found passing. This volume was passing around in 5 separate currents. The mine having been closed down for some time, and just being reopened, I took the safety lamp on this visit and examined every part of the mine in seach of gas, but could not find any.

I made another inspection of this mine on the 5th of December, 1900, and found it in a safe and healthy condition, with the ventilation satisfactory. I discovered at this visit that the shaft had been sunk to a lower seam of coal, and that the mine was now working two seams 160 feet apart, but as the lower one was working at night and the upper one during the day and not convenient for me to go down until night, I did not inspect the lower vein on this visit. I visited the mine again on the 11th of March, 1901, and found the ventilation in the upper vein very satisfactory and the mine otherwise in good condition. I examined all places and entries not then working and found them clear of any gas, with a strong current of fresh air sweeping through.

After completing my examination of the upper vein I descended to the lower one, which is 160 feet below, or 460 feet from the surface. The works in the lower vein I discovered to have been recently opened. The coal seems to be of a practically uniform thickness of two feet. It is underlaid by about 12 inches of fire clay mining, and overlaid by what seems to be hard and substantial slate. I noticed at this visit that the main entries had been driven north and south and each was a 100 feet or more from the bottom of the shaft. I discovered each one of the entries named had been driven 12 feet wide and made 7 feet high, and the roof was well secured by heavy timber. Four pillars of coal, each 37x54 feet, were left around the shaft bottom for support to the shaft, and the air-courses on the east and west were extended beyond these pillars, and the circle had been cut around. I also discovered on this inspection that entries were turned off the main north and south entries about 100 feet from the shaft bottom, and that there was about 600 feet of face at this date. The mine was perfectly dry, no water except that which was coming down the hoising shaft was noticed and that was thrown out by a steam pump. I found this vein free from gas and the ventilation satisfactory. I visited the mine and made another inspection on the 18th of June, 1901.and discovered that the upper vein had been temporarily abandoned, and all the work confined to the lower one. The first crash had come and made a considerable squeeze, but the weight seemed to have settled at this date without doing any more damage to the mine than the breaking and crushing of a few heavy timbers. The circle had been made all around the shaft bottom and air-courses completed, and the ventilation found satisfactory. The air furnished to the mine was entering through an air chamber partitioned off one end of hoisting shaft. The mine was not far enough advanced on this visit to prove the success of longwall. My opinion was that the roof was too friable and soft. On the 14th of September, 1901, I inspected the mine again and found that it had made considerable progress since my former visit. I discovered on this visit that the four pillars of coal left around the bottom of the shaft for support were too weak to withstand the crush when the squeeze came in general all over, as it crushed the pillars, broke all the heavy timbers and did considerable damage to the shaft by crushing and twisting the curbing and I found men at work doing the repairing and putting the mine in order. I noticed at date of last visit that work had commenced again on the upper vein, but as it is operated at night and no men at work at the time of my visit I did not make an inspection of it on this visit. The coal in the upper vein is 18 inches thick, while the coal in the lower vein is 24 inches in thickness. Both seams are worked on the longwall plan. The coal of both seams is of extra fine quality for both steam and domestic purposes and finds a ready market at Kansas City. About 75 men employed.

JOHNSON COUNTY.

(Production, 9,695 tons.)

Coal has been discovered in nearly every part of Johnson county, but very little mining has been done here of late. Thirty-five years ago extensive mines were operated at Carbon Hill, Clear Fork and Knob Noster, but all these mines were abandoned before one-tenth of the coal was worked out—owing to its inferior quality. When the mines of this county were first worked the coal industry of the State was in its infancy, but as soon as other coal fields were developed with a superior article of coal to supply the demand it readily took the market, but mines have been operated on a small scale in this county every year since its first discovery of coal and the past year is no exception. In the statistical table of this county will be found names of parties, amount of coal produced, with all other information concerning the mines operated last year at Knob Noster, Montserrat and Warrensburg.

LAFAYETTE COUNTY.

(Production, 439,217 tons.)

Lafayette county is one of the principal coal producing counties of the State. It is also the oldest as well as one of the largest producers and is exceeded only by Macon county. The coal seam underlying this county is very thin, but extending under nearly every acre of its territory. A mine can be opened and successfully operated in any part of the county, and the large production of coal every year from Lafayette is due to the yield of her numerous mines, which are located all over the county. Several large and productive mines have been worked out and abandoned during the past year, but larger mines and more productive ones in their stead have been developed, and we expect to find the coal production of this county larger this current year than ever before. There were 58 mines in operation here during the last year, which produced 439,217 tons of coal, valued at $709,849 for the product.

In producing this amount of coal 1,453 persons were employed in and about the mines in winter and in summer. Three inspections were made of all mines employing ten or more men since my last report was issued, and all were found in good sanitary condition. Following is a description of each mine:

Alma Post Office.

The same coal is mined at Alma as that in other parts of the county. M. W. Summers and Henry Dieckhoff operate mines in the locality of Alma during the fall and winter to supply local trade. Both mines have drift openings, and the coal is taken away in wagons and consumed at Alma and vicinity.

Bates City Post Office.

Thos. Perry is operating a local mine on his farm near Bates City to supply home trade. Drift opening. Coal consumed in vicinity.

Concordia Post Office.

A. F. Kresse is operating a mine 3 miles west of Concordia to supply local trade. Mine entered by a slope. Coal 20 inches and worked on the longwall plan. Coal taken away in wagons and consumed at Concordia.

Ed Rust operates a mine on the Hendrick land. Slope entrance. Coal 20 inches thick and operated during winter season.

H. F. Frerking is operating a mine west of Concordia. Mine entered by a slope and the coal consumed in the locality.

Henry Bartels is operating a mine near Concordia. Slope entrance. Coal 18 inches thick and worked on the longwall plan to supply home trade.

Peter Miller operated a mine last winter near Concordia to supply local trade.

Corder Post Office.

The Daisy mine is operated by W. H. Bell and is located southwest of Corder. Mine entered by a slope and ventilated by a small furnace. Coal 18 inches thick and worked on the longwall plan, and hauled in wagons to Corder.

J. H. Deholt. Mine located two miles west of Corder. Slope opening. Coal 18 inches thick. Worked on the longwall plan. Operated to supply local demand.

The Geisendorfer mine is located west of Corder. It is entered by a drift and operated in fall and winter to supply home trade.

The Morgan mine is located two miles southwest of Corder and operated by its owner in fall and winter.

Black Diamond mine is located at Corder. Shaft 30 feet deep. Hoisting by horse power. This mine is located nearly half a mile from the railroad, and the *product is hauled* from the mines in wagons, loaded on cars at Corder and shipped over the C. & A. R. R. The same seam of coal as that of other mines in the surroundings of Corder is worked here and on the same mode of working, and same price paid for mining. From 10 to 15 men employed.

J. Hudson operates a mine on his own farm during the winter months to supply home demand.

Diamond Coal Co. Mine located at Corder and has shipping connection with the Chicago & Alton R. R. by a switch. Shaft 58 feet deep and equipped with good horse power rigging for hoisting. Ventilation is furnished by the aid of a furnace, with excellent results. I inspecetd the mine on the 27th of September, 1900, and found it in first class condition; safe and healthy, with the ventilation double the amount required by law. The rock is taken down in all the entries, making them high enough for mules to haul out the coal, and the mine can be made a productive one. It is opened out very systematically and is practically operated. I visited the mine again on the 13th of May and found it closed down for the summer months, but discovered Mr. Wilson, the superintendent, making the necessary improvements and repairs ready for the fall and winter trade. I made another inspection on the 23rd of September and found it in excellent condition. The mine had just started up for the fall and winter trade and everything was in good shape to handle a large business. The entries are high, wide, dry and clean and the ventilation and operation is perfect. Thickness of coal, mode of working and price paid for mining is the same as that of other mines in this locality. From 40 to 50 men employed and the product is taken to Kansas City.

Corder Coal Co. Mine located half mile west of Corder and has shipping connection with the Chicago & Alton R. R. by a spur switch. Shaft 80 feet deep and operated by machinery. Ventilation is furnished by a fan, which was giving good results at dates of inspection. I inspected the mine on the 27th of September, 1900, and found all the underground workings in good condition and the ventilation satisfactory, but I discovered the cages without covers, and the hoisting ropes in poor condition. They were condemned and the management instructed to replace them with new ropes at once, and also to put covers on cages. I also discovered at this inspection that the communication between the two shafts was not of the best, as it was too much obstructed with water and dirt to be available for the employes to pass through in case of an accident to main shaft; this also was condemned, and the company instructed to sink an escapement shaft in a more convenient place at once. I visited the mine again on the 13th of May and discovered that the escape shaft was sunk and an entry driven from the straight east to communicate with it. I found the air good and the general condition of the mine satisfactory. New ropes had been put on to replace the old ones condemned, and the cages had been repaired and covers put on. I made another inspection of this mine on the 26th of October and found it all right, with the ventilation satisfactory. Thickness of coal, mode of working and price paid for mining is the same as that at other mines in this county. Thirty men employed. Coal taken to Kansas City.

Klondyke Coal Co. Mine located one mile north of Corder. Shaft 30 feet deep and hoisting by horse power. Ventilation is furnished by a small furnace. Coal 18 inches thick and worked on the longwall plan. About 5 men employed, paying $1 per ton for mining. The mine is operated to supply local demand.

Salt Fork Coal Co. Henry Liase, Superintendent. Mine located half mile east of Corder and has shipping connection with the C. & A. R. R. by a switch. Shaft 45 feet deep; equipped with good horse power rigging for hoisting. Ventilation is produced by the aid of a fan, with satisfactory results. I visited the mine on the 27th of September, 1900, and found it in good condition. I discovered the ventilative current stronger and fresher at date of this inspection than on any previous one. The air splits at the face of the north entry to the east and west, traveling along the face of the workings and uniting again at the face of the south entry and returning to the up cast. The current traveling along the east face passes over considerable stagnant water which makes it heavy and sluggish, retarding its speed, but as only few men were working in that current I found it enough to properly ventilate that side. I made another inspection on the 13th of May and found that it was closed down during the summer months, but I discovered several men at work making improvements and getting the mine in condition for fall and winter trade. I found men shooting rock at the north entry and opening a new entry on the west side; the east and south entries will soon be abandoned.

I made another inspection on the 23rd of September and found the ventilation fully satisfactory and the mine in very fair condition. This mine has to contend with considerable faulty coal, which causes extra expense to get it out, but it is operated very practically. Coal 18 inches thick and worked on the longwall plan, using the movable face track. From 40 to 50 men employed. The product is taken to Kansas City.

Higginsville Post Office.

Higginsville is located near the center of Lafayette county, and is surrounded by coal mines, nearly all having shipping connection with the C. & A. and Mo. P. railways. There are 13 mines, large and small, in the immediate vicinity, of which 10 are commercial, having connection with the above named railroads, while the 3 remaining mines are operated to supply home consumption.

Bonanza Coal Co. Mine located two miles east of Higginsville and connected with the C. & A. R. R. or shipping facilities. Shaft 70 feet deep and equipped with horse power for hoisting. The mine is ventilated by the aid of a furnace, which is giving good results, supplying plenty of fresh air to every part of the mine. I made an inspection of the mine on the 8th of September, 1900, and found it in good condition. It had been idle during the summer owing to depressions in the coal trade and only just started for the fall and winter work. Twenty men employed. I made another inspection on the 15th of May and found the mine in good condition. The rock on the entries had been shot down, and I found them high, wide, dry and clean, with 30 men at work. I visited the mine again on the 26th of October and found it in good condition, but the ventilation on the east side was weak owing to small and contracted airways, but the evil will soon be remedied by enlarging them. Thirty men employed. Coal shipped to Kansas City.

Farmers' Coal Co. Chas. Whilhelm, Superintendent. This company owns and is operating two mines one and one-half miles south of Higginsville, both of which are ocated on the Rocky branch, having shipping connection with the C. & A. and Mo. P. railways. Ventilation is furnished both mines by the aid of a fan, with very satisfactory results. The two mines have an underground connection and are working the same coal face and are ventilated by the same fan, and for all practical purposes may be considered one mine with two openings. I inspected both mines on the 8th of September, 1900, and found them in first class condition. I discovered on this visit that a fan to supply ventilation had taken the place of the furnace—a change always most accentable to the inspector and of decided benefit to the sanitation of any mine. Electric machines had been put in to do the undermining in place of picks, and men were employed at date of this visit to run the machines at $1.94 per day and 60 cents per ton was paid to miners for loading coal after the machines and keeping up the rooms. I visited the mine again on the 15th of May and found men at work enlarging shaft No. 3 in order to increase its output. The size of the shaft will be 7x14 feet, made large in order to accommodate the large pit cars to be used in conveying the product of both mines to the one shaft; if this can be worked satisfactory, then one shaft will be abandoned.. I made another inspection of these mines on the 23rd of October and found them in excellent condition, with the ventilation fully satisfactory. We observed on this visit that six machines of the Link Belt pattern were employed to undermine the coal. Machine runners were paid $2.25 per day. The shaft had been enlarged and the output largely increased, which makes this mine one of the largest producers in the county. Coal 18 inches thick and worked on the longwall plan. About 120 men employed at both mines. Product consumed at Kansas City.

J. H. Looney Coal Co. William Balew, Superintendent. Mine located one mile west of Higginsville and has shipping connection with the C. & A. R. R. by a spur switch extending from the main track. Shaft 72 feet deep and operated by steam power. The mine in ventilated by a fan and giving satisfaction. I inspected the mine on the 8th of September, 1900, and found it in a satisfactory condition, with a strong current of fresh air flowing around the workings. May 15th I visisted the mine again and found men at work making repairs, hence no inspection was made on this visit. I made another inspection on the 23rd of October and found it satisfactory, with the exception of one hoisting rope, which was condemned and ordered replaced with a new one at once. Coal 17 inches thick and worked on the longwall plan, using the moveable face track. Thirty men employed. Product consumed at Kansas City.

Higginsville Consolidated Farmers' Coal Co. G. W. Stealey, Superintendent. This company owns 7 mines in the surroundings of Higginsville, but only 6 were operated during the past year. All of the mines have shipping connection with the C. & A. and Mo. P. railways.

Mine No. 1 is located on the west of Higginsville. Shaft 70 feet deep and equipped with machinery for hoisting. Ventilation is furnished by a fan with good results, and the mine in this respect satisfactory. I inspected the mine on the 7th of September, 1900, and found it in good condition. The roadways had been reconstructed, cleaned and found in good repair. I discovered the cages in a rickety condition and instructed the company to have them repaired. I visited the mine again on the 14th of May and found it closed for the summer and men were at work blasting rock and making other repairs in getting the mine in condition for fall and winter trade. I made another inspection on the 24th of October and found it in good condition, with all the safety appliances in good repair. Coal 18 inches thick and worked on the longwall plan. About 40 men employed, and receiving $1 per ton for mining. Product shipped to Kansas City.

Mine No. 2 is located two miles west of Higginsville and has shipping connection with the Chicago & Alton R. R. by a switch. Shaft 45 feet deep and operated by horse power. Ventilation is produced by the aid of a furnace, and is giving very fair results considering the distance the air has to travel through small and contracted air courses, with many bends and angles encountered on its route. I visited the mine on the 7th of S[illegible] 1900, and discovered that the steam machinery had been taken down and removed to mine No. 6 and a horse power apparatus built in its place. I found the mine in a satisfactory condition on this visit, with from 25 to 30 men at work. May 14th I visited the mine again and found it closed down for the summer, hence no inspection. I made another visit on the 24th of October and found the track had been taken out, the pit top taken down and the mine permanently abandoned.

Mine No. 3 is located one and one-half miles south of Higginsville on the Rocky branch, and has shipping connection with the C. & A. and Mo. P. railway. Shaft 25 feet deep. Hoisting by horse power. This plant was burned down several years ago and the mine remained idle until recently. The company took out the water and sunk another shaft, which is now used for hoisting, and the old shaft is used for an escape shaft. Coal 18 inches thick and worked on the longwall plan. About 30 men employed.

Mine No. 5 has a slope opening, and is operated by a few Bohemians who place the coal on the cars at a given price. Mine located on the Rocky branch.

Mine No. 6. Geo. Frank, Foreman. Mine located on Rocky branch one and one-half miles south of Higginsville, and has shipping connection with the C. & A. and Mo. P. railways. Shaft 25 feet deep and operated by steam power for hoisting. Ventilation is secured by the aid of a fan, with excellent results. I visited this mine on the 7th of September, 1900, and discovered that the horse power apparatus had been taken down and removed, and a steam plant built in its place. I found the inside workings of the mine in good condition. An underground connection between this and mine No. 2 will soon be made, and the coal of the latter mine will be taken out through mine No. 6, which will make this mine the largest producer in this locality.

I visited the mine on the 15th of May again, and found it in good condition. I also found considerable improvement made and more in course of construction, with a view to increased output. A fan will soon be erected to take the place of the furnace, which will be more satisfactory. On the 24th of October I made another thorough inspection and found the mine in excellent condition, with the ventilation satisfactory. A fan had been built here since my former visit, and this mine now is one of the best ventilated in the State. Coal 18 inches thick and worked on the longwall plan. Sixty men employed. Product consumed at Kansas City.

Mine No. 7 is a contract mine. It has a drift opening, and the ventilation is furnished by the aid of a furnace. Mine located two miles south of Higginsville on the Rocky branch and has shipping connection with the C. & A. and Mo. P. railways. Made 3 inspections of the mine since last report and found it in good cnodition. Coal 18 inches thick and worked on the longwall plan, using the moveable face track. About 30 men employed. Coal consumed at Kansas City.

The Hoffman mine is located southeast of Higginsville. It is entered by a slope and ventilated by a furnace. Thickness of coal, mode of working and price paid for mining is the same here as that of other mines in this locality. The product is taken away in wagons and consumed in the surrounding neighborhood. Eight men employed in winter, receiving $1 a ton for mining.

J. R. Longest has a mine an his land which was leased the previous year to J. S. Stephenson. Drift opening and ventilation is furnished by a furnace. Coal 18 inches thick and worked on the longwall plan. This mine has no shipping facilities and the coal is taken away in wagons. Six men employed in winter to supply home trade.

M. Woskoski operates a mine south of Higginsville during fall and winter to supply home demand.

Lexington Post Office.

Lexington is the oldest mining town in the State. Mining has been prosecuted in its vicinity for nearly 60 years, and the output of its mines is yearly increasing. Early in the 19th century coal could be found cropping out along the Missouri river banks for a distance of 20 miles or more east and west of the present location of Lexington, inviting the miner with his pick to come and get it out. Mines were operated in this locality to supply the numerous steamboats plying the Missouri river long years prior to the construction of a mile of railroad in the State. Comparatively speaking, mining is yet in its infancy here, as the seam is almost inexhaustible. Some large and heretofore productive mines have been abandoned along the river bank on account of the long haul of the coal out of the mine; other larger and which will prove more productive mines are being developed, and these will increase production. Three are about 18 mines, large and small, in the immediate surroundings of Lexington, giving employment to about 900 men and boys. All the coal mined at this point, with the exception of the home demand, is shipped to market over the Mo. P. R. R. to Kansas City, Sedalia, Jefferson City and local towns along the line. Following is a description of the several mines and their location, together with statement of the condition in which we found them at dates of inspection:

Bell & Greer. Mine located southwest of Lexington. Ventilation secured by the aid of a small furnace, but fully adequate to the demands of the mine; it has two drift openings for the inlet and out let of the air. Coal 18 inches thick, worked on the longwall plan and hauled away from the mine in wagons and consumed at Lexington. From 6 to 12 men employed, receiving \$1.12½ per ton for mining and wheeling in winter and 95 cents in summer.

C. A. Chanslor. Mine located on the south bank of the Missouri river east of Lexington. Drift opening and ventilated by a furnace. This is called a city mine as all the coal is hauled away in wagons and consumed at Lexington. Underground connection having been made with the Walton mine on the west side, added more air to the ventilative volume and makes the current stronger. Ten men employed and \$1 per ton paid for mining.

Dover Coal Co. T .Davis, Manager. Mine located at Dover and has shipping connection with the Boonville & Lexington branch of the Mo. P. R. R. Mine entered by a drift and ventilated by a furnace. I made 3 inspections of this mine during the past year and found it in a very fair condition on each visit. I discovered on my first visit during the past year that the air entered the first south entry off the east instead of the straight south, thus shortening the route of the current as well as enlarging the area, making the air stronger all over the mine. The rock was blasted down on the entries, a heavier rail laid, and a mule is now used to haul the coal. Thickness of coal, mode of working and price paid for mining is the same as at the mines in the surroundings of Higginsville and Lexington. About 40 men employed. One dollar per ton paid for mining. Coal consumed at Kansas City.

O. M. Gaffin. Mine located two miles east of Lexington and has shipping connection with the Mo. P. R. R. by a spur switch extending from the main track. Mine entered by a drift and ventilation is secured by the aid of a furnace. This mine was formerly operated by the Lexington Coal Co., but was abandoned for several years and filled up with water, but about two years ago Mr. Gaffin took out the water, cleaned up the mine and commenced operations. I made the first inspection at this mine during the past year on the 14th of September, 1900, and discovered that the furnace was inadequate to properly ventilate the mine and that it had to be enlarged or the air courses had to be cleaned and made larger. The mine makes considerable water, which accumulates in the airways, thus retarding the ventilative current on its route and the company was instructed to provide a remedy at once. I visited the mine again on the 18th of May and found it idle, hence no inspection was made at this date.

I returned on the 26th of September and found that the air-courses had been cleaned and enlarged and the ventilation good; 45 men at work. Thickness of coal, mode of working and price paid for mining the same as other mines in this locality.

I. C. McGrew. Mr. McGrew owns and is operating two mines in *this county*, which are located three miles west of Lexington and have shipping connection with the Missouri Pacific railroad by switches. Both mines are entered by drifts, and are ventilated now by a furnace. The two mines have an underground connection and are working the same coal face and may be termed one mine with two openings. I made the first inspection of these mines on the 13th of September, 1900, and found them in excellent condition, with three times the amount of air required by law. I discovered that an air shaft had been sunk between drifts one and two and a furnace built to secure ventilation in place of the fan. The air shaft having been sunk on the bluff at an elevation of 170 feet above the entrance to the mine, provided such extra natural assistance that it enables the management in cold weather to dispense with the furnace. The furnace being located between drifts one and two, the air currents now enter the mines at the respective drifts, travel around the face of the working on each side, and meet at the upcast. I also discovered that Mr. McGrew had put in the Link Belt electric machines in his mines to do the undermining with machines in place of picks, but as they were just newly introduced and all the hands new and unfamiliar with their work no test was attempted.

I made another visit to these mines on the 16th of May and found that the miners were not at work, owing to some dispute between them and Mr. McGrew, but I found a force of men at work in the mines making preparations to put in electric haulage. The old roadway had been taken out and replaced by a heavy rail, and when completed and ready for operation will make these the best mines in the county. I made another inspection on the 25th of September and dicovered that the electric haulage had been completed, was in operation and proved to be a success. All the mules were taken out of Mine No. 1 and the electric motor put in to do the work at that mine; it work proved so successful that Mr. McGrew purchased another motor and put it to work at Mine No. 2 in place of mules. This method of haulage is an innovation in Lafayette county, though it is a success in other counties. All the entries are lighted by electricity, giving the mines an up to date appearance in every respect. I found the mines in excellent condition at date of this visit; the ventilation was extra good, the entries high, wide, dry and roomy, and the mines clean and healthy, with good roadways. The company has spared neither time or money to make the mines first class in every respect.

The coal is about 18 inches thick and worked on the longwall plan, using the movable face track. Machine runners and paid at the rate of $2.25 per day, and loaders after the machines get 63 cents per ton for loading, wheeling same to the junction, to clean up the rooms and keep them in repair. From 125 to 150 men and boys employed in the two mines. The product is shipped to Kansas City, where it is consumed.

Jas. Rosewell & Bro. operate a mine east of Lexington. Shaft 75 feet deep, and operated by horse power. Mine ventilated by a furnace with good results. Coal 22 inches thick and worked on the longwall plan; from 3 to 6 men employed. The product is consumed in the surrounding country.

The Walton mines is located on the east side of Lexington on the bank of the Missouri river, and is called a City Mine. It is enterde by a drift and ventilated by a furnace. It is also connected on each side by other mines, and the air enters the mine on the west, passing along the face of workings to the Chanslor mine, making the ventilation good in all three. Thickness of coal, mode of working and the price paid for mining is the same as that of other mines in this locality.

Seth Spruce operates a mine adjoining the Walton mine, but only in fall and winter to supply home trade.

The Macey mine is located about two miles west of Lexington and has shipping connection with the Missouri Pacific railroad. Mine entered by a drift and ventilated by a furnace, which was giving very good satisfaction at dates of inspection. I inspected the mine on the 13th of September, 1900, and found it in very fair condition, with ventilation satisfactory. I visited the mine again on the 16th of May and found it idle, hence no inspection was made. I made another inspection on the 25th of September, 1901, and found that the mine had just started up. The ventilation was satisfactory; 25 men were at work. Thickness of coal and other conditions are the same here as that of other mines in this locality.

The Stay Coal Co. Mine located 5 miles east of Lexington, and has shipping connection with the Boonville and Lexington branch of the Missouri Pacific R. R. Mine entered by a drift and ventilated by a furnace with satisfactory results. I inspected the mine on the 14th of Septetmber, 1900, and found it in good condition, with ventilation good all over the mine. I discovered that all the work on the east near the entrance had been abandoned, and new works opened out on the south and west. The ventilative current enters the mine through an old drift on the east side, and travels along the face of the workings to the upcast, giving good results. I visited the mine again on the 18th of May, but found it idle; no inspection was made. I made another inspection on the 26th of September and found it in very fair condition, with the ventilation good. The coal is 22 inches thick, and worked on the longwall plan. The moveable face track is practiced here. About 30 men employed. Product consumed at Kansas City.

Arell & Serrat Coal Co. Mine located at Lexington, near depot, and has shipping connection with the Mo. P. R. R. by a spur switch. Shaft 125 feet deep, and equipped with first class machinery for hoisting, draining and ventilating. This mine was sunk in the year 1894, and rigged up with good equipment. An escapement shaft was sunk and a fan erected on top of same, and the plant was constructed with modern inprovements, being sunk, however, in close proximity to abandoned mines which were full of water, the company was caused considerable expense in taking it out and as the mine of itself was making a large amount of water made it a very expensive mine to operate. The year 1894 being the year of greatest depression in the coal trade of this State, the company, after spending a large amount of money, concluded to quit operation and closed down the mine temporarily in the Spring of 1895, and it remained closed until the spring of 1901, when Mr. Serrat took out the water, cleaned the mine and started operation in the month of May. I made a thorough inspection of it on the 26th of September and found the ventilation disarranged at certain places for want of doors, and while the fan was delivering plenty of air to the mine the current was allowed to travel in a direction contrary to that where it was needed. We were informed while at the mine that a new man had taken charge of the underground work on that day and had already started to hang doors and conduct the air around its proper route and we have every reason to believe that the ventilation has been satisfactory since the date of last visit, as no complaint has been received since then at this office.

The mine is still making a large amount of water and roadways have to be corduroid. Coal 20 inches thick and worked on the longwall plan. About 40 men employed. Coal shipped and consumed at Kansas City.

Lexington Coal & Mining Company. Major R. M. McDowell, Mgr.; office at St. Louis. B. F. Wiley, general superintendent. This company ownes and is operating 5 mines in this county at present, and this number will be increased in the near future as the company contemplates opening more new ones. All the mines are located on the south side of the Missouri river, on the east and west of Lexington, and have shipping connection with the Missouri Pacific railroad. The mines are worked on the longwall plan, and the price paid for mining at present is $1.05 per ton for pick mined coal and 63 cents for loading machine coal, all coal to be wheeled and delivered at the junction. A contract for the above prices was signed by the miners and operators in the month of May, 1901, which took effect on the first of June, independent of the action of the conference of miners and operators held at Kansas City in the month of June, and this contract was made for one year.

The thickness of the coal on the west side of Lexington is about 18 inches, while on the east side it is about four inches thicker. The coal is underlaid by a good fire clay mining, and is overlaid by a strong rock roof, which is well adapted for the longwall system of mining, as no timber is used or needed. The movable face track is used in all the mines of this company, which is not only very convenient and economical, but of a decided advantage to the the miner in loading his coal. The mines of this company are practically operated, well ventilated, and the requirements of the mining laws observed in every respect. All necessary improvements in and about the mines are attended to during the slack times in summer, and when the fall and winter trade opens, the miners are in condition to furnish the coal and supply the demand without being hampered with breakdowns. The new mines recently sunk and their equipment will be fully described in this report. Follownig is a description of the mines and their location:

Graddy Mine, Wm. Parks, foreman. Mine located about two miles west of Lexington. Mine entered by a drift and ventilated by a furnace which is giving excellent results. The ventilative current enters the mine at the mouth of the drift, and travels the south entry until it reaches the cross entries, where it divides to the east and west, passing along the face of the workings until it reaches the main south at its terminus where the two currents unite and return to the furnace. The furnace shaft having been sunk on top of a high hill with an elevation of 150 feet above the inlet, causes a constant current of air to travel through the mine at all seasons when the temperature of the mine is above that of the outside by this natural ventilation without the aid of the furnace. I inspected the mine on the 13th of September, 1900, and found it in a satisfactory condition. On the 16th of May, I made another inspection and found ventilation and general condition of the mine all right. On the 24th of September, 1901, I made another thorough inspection and found the ventilation fully satisfactory and the mine in good sanitary condition. The air in this mine has a long distance to travel, as the main entry is nearly a mile from its entrance to its terminus, but the air is fresh and strong all over the mine. The roadways are double on the main south entry and the mules are thus enabled to pass one another without waiting, making good headway in hauling out coal.

The Seawell Mine is located at Meyrick Junction, Elias Spruce, foreman. It is entered by a drift and ventilated by a furnace, which was giving good results at dates of inspection September 13th, 1900, May 18th, and September 24, in 1901. I found the ventilation good and the mine in good repair. It has been in operation for a great number of years, and the ventilative current has a long route to travel, but still the mine is well ventilated, and the foreman is to be commended for improving the current by shortening its route at every opportunity.

The Glen Oak is located about three miles east of Lexington, and *has shipping connection* with the Mo. P. R. R. by a spur switch three-fourths of a mile long, extending from the main track. Shaft 45 feet deep. Equipped with good machinery for hoisting. Ventilation is fursnihed by two fans, set at separate location and operating on separate currents. I made the first inspection of this mine on the 20th of August, 1900, and found the ventilation good. The ventilative current is divided into three divisions; one current travels the main east entry to its terminus where it is split to the north and south, the current traveling on the north side was conducted to one fan, while the current on the south side and that of the west side was conducted to the other fan, and each furnishing a sweeping current of fresh air to every part of the mine. I made another thorough inspection of this mine on the 26th of September, and found it in a satisfactory condition, with the ventilation good all over it, and the safety appliances in good repair. This mine at date of last inspection had 150 men and boys employed, and is the largest producer in this county. Thickness of coal, mode of working and price paid for mining is the same as that of all the other mines operated by this company in this locality. Having mentioned in the last annual report from this department that the Lexington Coal Company had purchased a large tract of coal land two miles southwest of Lexington. We are pleased to state in this report that great progress has been made by the company in sinking shafts, developing the mines, and improving the newly acquired property. On our first inspection of these new mines on the 16th of May, 1901, we found two shafts had already been sunk and equipped and preparation being made to sink the third one. About three miles of railroad had been constructed, many new houses built at mines for the use of miners and a large number of houses removed from abandoned mines and rebuilt here, making this a very promising and populous mining camp. These mines are known as the Valley, Midway, and Summit mines. Their equipment is first-class, and from their contemplated output, for which they are so well arranged, must of necessity prove of great benefit to the community as well as to the company. In mentioning the plan and equipment of the Midway Mine we shall have described all, as each is an exact counterpart of the other, except the depth of the respective shafts, and the generation of the electric power which is confined to the Midway, or Central Station. The Valley Mine reached the coal at a depth of 87 feet: the Midway at 138 feet, and the Summit at 180 feet. The hoisting machinery consists of a pair of first motion engines, built by the Danville Foundry and Machine Company of Danville, Illinois. These engines, in pattern, resemble the Litchfield engines, but are, we think, an improvement over the latter. The cylinders are 16x32 inches, the drum is double, six feet in diameter with a six-foot face, and is so arranged that it can be made to act as one, delivering material to any elevation desired, permitted by the length of the hoisting rope. By this device no slack rope has to be taken care of. Boiler houses are built of brick, with iron roofs, and supplied at first by two boilers 72 inches in diameter by 22 feet long, with 26 six-inch flues each. These boilers are steel and are suspended from steel eye beams resting on cast iron columns on an independent foundation, the brick walls surrounding them in no way or manner acting for a support. This is a new feature so far as coal mining equipment is concerned and will prove of great benefit and economy in the event of repairs, besides avoiding the injury to the boiler walls by expansion. The pit head is 64 feet high from the ground to the pulley wheels and composed of solid pieces of timber 12x12 inches. Reaching the bottom of the shafts we found the main entries running east and west for one hundred feet on each side of the shafts. These entries are 15 feet wide and six feet high; cross entries are then turned off of the main entries to the north and south on a curve of fifty radius. The shafts are 7x14 feet and arranged with three compartments, two of which will be used in lowering and hoisting the cages, while the other will be used for pipes, wires and ladders. The over-casts follow after plans not only new in our State, but they are of the most substantial nature. The roof rock is seven feet in thickness, and above this in the solid strata the over-casts have been driven from the air or fan shaft over and above the main entries to the south edge of the entry pillar; thence connecting with the main air course. The advantage of such an over-cast must be apparent to all in any way familiar with such matters, as it is good for all time and requires no repairs or further attention. The ventilative volume will be conducted around the workings at each mine in four different currents and will prove very healthy and well ventilated mines. An escapement shaft has been sunk at each mine and a fan 12 feet in diameter is erected and located over a shaft 7x10 feet of which 7x7 feet have been partitioned off for the air to pass, and 3x7 for a manway where ladders have been put in for exit in case of necessity. These ladders are constructed of Norway iron to insure the largest possible factor of safety. The coal will average 22 inches in thickness, and worked on the longwall plan. It is of a most excellent quality for steam or domestic purposes. As the Midway mine is the central station from which will be transmitted the electricity to operate the other mines, an additional building 44x30 feet has been built at the mine, and in addition to the hoisting plant an electric plant is also provided of two 150 K. W. dynamos. Generator driven by a 250-horse power high speed engines. This plant is expected to furnish the power for mining and haulage in the three mines, one of which is 3,800 feet north of Midway and the other 5,200 feet south of the same point. When the three shafts are fully completed the cost of sinking and equipment will reach $70,000. The mines each have an estimated life for fifteen or twenty years, with an average daily output at each of 25 cars per day, or a total product of 75 cars per day. In addition to the above numerous improvements may be mentioned a large blacksmith and machine shop which has been erected and provided with lathes, power punch, cutter, drill press, emery wheels, grinstone, saws, forges, and all the tools and the necessary machinery to build pit cars and make all the repairs about the mines. I visited these mines again the latter part of September and discovered several machines at work undermining the coal, but the haulage way being short, the coal as yet is taken out by mules. In the next annual report we will attempt an estimate of the work done by each machine, and the labor and expense of running same. The mines at the time of writing this report, January 30th, 1902, have about 150 men at work in them and are producing about 30 cars of coal per day, and are daily putting on more men and increasing the output, and by the time this report reaches the hands of its readers the mines will be great factors in the coal production of Lafayette county.

Mayview Postoffice.

Mayview Coal Co. Mine located near Mayview on the west, and has shipping connection with the Chicago & Alton R. R. Shaft 130 feet deep, and operated by steam power. Ventilation is furnished by a furnace with satisfactory results. I inspected the mine on the 10th of September, 1900, and found the ventilation all right, but shaft curbing was bulging into the shaft and stopping the cages from running, and instructions were given to have curbing taken out and shaft retimbered. I made another inspection in May and found the shaft in better condition. I discovered on this visit that the mine had changed hands, and the new operator was having considerable improvement made below. The ventilation was good, but safety catches were found in bad condition, and ordered repaired. I visited the mine again on the 26th of October, and found it in a satisfactory condition. Fifteen men employed.

A. Alcorn operates a mine near Mayview in the winter months to supply local trade.

Jake Stephens is operating a local mine southwest of Mayview to supply local trade.

The Wright Mine is also operated during fall and winter and the coal consumed in the vicinity.

Napoleon Postoffice.

The mine formerly operated by Duffendack, and known as the Napoleon Coal Co., was closed down and abandoned in the year 1894, and it remained idle until the past year, when the present operator took out the water, cleaned the mine and commenced operation in the spring of 1901. The mine is located one mile east of Napoleon and connected with the Mo. P. R. R. by a switch. Shaft 45 feet deep, operated by horse power. Ventilation is furnished by a small furnace, which is not fully up to the requirements of the mine. I visited the mine in February, but found it idle and did not make any inspection. On the 27th of September I made another inspection, and found the ventilation deficient and weak, and requested it remedied at once. Ten men employed.

Waverly Postoffice.

Silver Creek Coal Co. Mine located one-half mile west of Waverly, and has shipping connection with the Mo. P. R. R.. Shaft 125 feet deep. Operated by steam power. Ventilation is furnished by a small fan which is doing effective work by properly ventilating the mine. I made three inspections of the mine during the past year, and found it in a very fair condition on each visit. I discovered at date of last inspection, October 25th, that the company had not sunk an escapement shaft, and was instructed to do so at once. Coal 46 inches thick, and worked on the room and pillar plan, and 70 cents per ton paid for mining.

The Buckhorn Mine is located one mile west of Waverly and connected with the Mo. P. R. R. by a switch. Shaft 110 feet deep, and operated by machinery for hoisting. Ventilation is secured by a fan with good results. The mine has been closed down several times and changed operators as often. The coal will average nearly four feet in thickness, and seems to be of very good quality for steam purposes. The roof over the coal is a black slate easily secured by timber, and by good management this mine, in our opinion, could be successfully and profitably operated.

Wellington Postoffice.

Wellington Coal Mining Co. Mine located two miles west of Wellington and has shipping connection with the Mo. P. R. R. Shaft 40 feet deep, and hoisting by horse power. It is ventilated by a furnace with very satisfactory results. I visited the mine three times since last report, but found it idle at date of one of my visits, and only two inspections were made of the inside workings. The mine was found in good condition at each inspection. Coal 18 inches thick, and worked on the longwall plan, using the moveable face track. From 30 to 40 men employed during fall and winter, receiving $1.00 per ton for mining. Coal consumed at Kansas City.

Labor Exchange Coal Mining Association. Mine located one mile west of Wellington. Shaft 106 feet deep, using steam power for hoisting. The mine has shipping connection with the Missouri Pacific Railroad by a spur switch extending from the main track. Ventilation is furnished by a furnace with excellent results. This mine is operated on the co-operative plan, and all the shareholders are practical miners. It is opened and operated very practically, and in all particulars satisfactory to the Inspector. I made three inspections since last report and found the mine in excellent condition at each visit. An escapement shaft was sunk since former inspection, and a furnace built, and all other demands of the law fully complied with. Thickness of coal, mode of working, and price paid for mining is the same as that at other mines in this locality.

L. B. Zeits. Mine located one and one-half miles east of Napoleon, and has shipping connection with the Mo. P. R. R. Shaft 40 feet deep, and hoisting with horse power. Ventilation is satisfactorily furnished by a small fan. This was formerly operated by the Missouri River Coal Co., but in the year 1896 the plant burned down, and the mine remained idle until recently, when the present operator leased it, took out the water and commenced operation. At date of first inspection, September 12th, 1900, 15 men were employed, and the mine was found in good condition. The rock had been shot down in all the entries and mules used now to haul out the coal. I visited the mine again on the 17th of May and found it idle. No inspection made. On the 1st of November I visited the mine again and found it in good condition. Coal 18 inches thick and worked on the longwall plan, using the moveable face track. From 15 to 20 men employed. Coal consumed at Kansas City.

The Carter Mine is located 1½ miles east of Wellington, and has shipping connection with the Missouri Pacific Railroad. Mine entered by a drift and ventilated by a furnace. I made three inspections of the mine since last report was issued and found the ventilation good at each inspection. At date of first inspection, September 12th, I discovered a new air shaft sunk on the left side entry at the face of the workings and a new furnace built which was giving good results. May 16th I visited the mine again and found the air good, and on my third inspection on the 1st of November, I found the ventilation satisfactory. The mine is operated along side of a hill in the croppings and is very wet, but it has a natural drainage, and while the roadways are wet, there is no lodgement of water over them. Coal 18 inches thick and worked on the longwall plan; from 30 to 40 men employed. $1.25 per ton is paid for mining and wheeling during the winter months. The product is consumed at Kansas City and points west.

I. A. Edmonds sunk a shaft during the past year, half a mile east of Waterloo and struck coal at a depth of 43 feet, and equipped the mine with horse power apparatus. The mine is worked on the same seam, and the same method of mining practiced as that of other mines in the same locality. Coal is shipped to Kansas City over the Missouri Pacific Railroad. Ten men employed.

LINN COUNTY.

Production, 85,459 tons.

The Brookfield Coal Co., operates a mine, half a mile east of Brookfield, and has shipping connection with the H. & St. Joe R. R. by a spur switch. Shaft, 150 feet deep, and operated by steam power. Ventilation is furnished by a furnace which gives plenty of air to the few men that work in the mine; but it is a poorly constructed furnace, and we instructed the company to take it down and build it anew. Coal, 28 inches thick; but there is a layer of slate 8 inches in thickness running regularly through the center of the coal which has to be picked out and thrown away, leaving only from 18 to 20 inches of coal to be loaded out. This slate or "Black Jack," as the miners call it, fills up the gobs to that extent that the men have to run out dirt for want of room. It is worked on the longwall plan, and employs from 10 to 18 men, while connection is made with the H. & St. Joe R. R., very little of the product is shipped; it is mostly consumed at Brookfield and vicinity.

I. Burdell & Co. sunk a new shaft during the past year, and stuck coal at a depth of 135 feet; the mine is equipped with horse power rigging for hoisting. Coal 28 inches thick and worked on the longwall plan. Coal consumed at Brookfield. Instruction given to company to sink escape shaft.

The Black Plume is operated by its owner, Mr. Wm. Nickells. It is located half mile south of the Burdell mine and is working the same coal seam, on same method as last named mine, and the same price paid for mining. Shaft, 150 feet deep; hoisting by horse power. Product consumed in the immediate surroundings.

The Schaefer Mine is located two miles northeast of Brookfield. Shaft, 150 feet deep and operated by steam power for hoisting. Ventilation is secured by the aid of a furnace, and the mine is well ventilated. Coal, 28 inches thick and worked on the longwall plan, the roof over the coal is of the slate and soapstone variety and easily secured by timbering. This has a good output for a local mine, and could be made a productive one if it had shipping connection; but located as it is two miles from the railroad it is confined to local trade and the product is consumed at Brookfield and vicinity.

L. R. Williamson operates a mine in the same locality as the Schaefer. Shaft, 155 feet deep; using horse power for hoisting. Ventilation is furnished by a fire basket with very poor results; an air shaft was sunk during the year. Coal, 28 inches thick and worked on the longwall plan.

Marceline Postoffice.

R. F. Landreth & Son operate a mine at Marceline. Shaft, 144 feet deep; hoisting by horse power. Ventilation is furnished by a furnace and at date of first inspection I found that there was plenty of air coming down the mine, but the aircourses were so choked up with dirt that the air could not travel through in sufficient quantity to ventilate it properly and instructions were given the company to have them cleaned at once. This mine is supplying local trade. and running only in fall and winter. During the summer season the roof caves and falls on the entries and in the air-courses, where it is allowed to remain until winter sets in, business is then good and time cannot be taken to clean up as there is more money in sight in taking out the coal, so the falls are thus permitted to accumulate blocking passage ways and interferring with the air current. This kind of management indicates the wildest kind of false economy, to say nothing of the indifference displayed in providing suitable conditions for miners to work in. Coal, 28 inches thick and worked on the longwall plan. It is consumed at Marceline and vicinity.

Marceline Coal Co., James Hemmings, superintendent; Barney McElwen, foreman. Mine located at Marceline, and has shipping connection with the Santa Fe Railrorad by a spur swith extending from the main track. Shaft, 185 feet deep; equipped with first-class machinery. The mine is ventilated by a 12-foot fan, which was running at a speed of 75, 68 and 90 revolutions per minute respectively, at dates of inspection, and was passing 17,660 cubic feet of air in same time on the west side, while 16,140 cubic feet was passing on the east side in same time. All the work has been confined to the south side of the mine for several years, and this volume of air was circulating around the workings on that side; the main current traveling the main south entry to its terminus and there split to the east and west, but enough air was permitted to escape on each entry to keep them fresh and healthy for men and mules to pass through. The main volume of the ventilative current passes along the face of the workings and returns to the up-cast; the current from the east returning to the fan shaft over an air-crossing. Three inspections have been made of this mine since the last report was issued, and the ventilation as well as the general condition of the mine was found satisfactory. I made the first inspection on November 28th and found about 200 men and boys employed, and the mine in good condition. I returned on the 2nd of May and made another inspection with satisfactory results, I found the ventilative current good at the face of all the working places, and the mine in good sanitary condition. This mine is extensively worked, all the entries are driven about 2,000 feet from their starting point, which makes the coal faces 4,000 feet apart from east to west; this makes a long route for the air to travel, but as the mine is practically operated the management does not encounter any difficulty whatever with a difficiency or an impure air. As soon as an entry is cut off and abandoned, it is immediately filled up with dirt—which accomplishes two purposes, viz.: one avoids the accumulation of black damp, and the other furnishes support to the roof and holds it in place. The benefits derived by the air current from this method is very noticeable for after its return to the up-cast after traveling over a route of about 7,000 feet, it is nearly as fresh as when it enters the mine, and the lights burn as bright. I made another inspection on the 16th of August and found the mine in a healthy condition. The ventilative volume was not so strong on the main south entry at this date as at former inspections, owing to defects in the casing and blades of the fan, which were ordered repaired at once. Coal, 28 inches thick and worked on the longwall plan; $1.05 per ton is now paid for mining. About 200 men and boys employed. The Santa Fe Railroad Company consumes a large portion of the product.

LIVINGSTON COUNTY.

Production, 1,177 tons.

Chillicothe Postoffice.

John Adams operates a mine five miles north of Chillicothe during winter season to supply local demand. Shaft, 70 feet deep; hoisting by horse power. Coal, 18 inches thick and worked on the room and pillar plan. Product consumed at Chillicothe and that locality.

The Cox's Star Mine is located in the same neighborhood, and is operated by its owner, W. L. Cox. Mine only operated in fall and winter, and the product consumed in vicinity.

The Eagle Coal Mine is operated by the Cox Bros. Shaft, 60 feet deep; hoisting by horse; coal, 22 inches thick and worked on the room and pillar plan. The mine is located five and one-half miles north of Chillicothe, and the product is hauled and consumed in that city and vicinity.

Mooresville Postoffice.

Tindell & Co., operate a mine near Mooresville. It is entered by a slope and ventilated by a small furnace. Coal, 18 inches thick and worked on the longwall plan, mine only operated in fall and winter, and the coal is taken away in wagon and consumed at Mooresville and vicinity.

MACON COUNTY.

Production, 1,025,213.

This is the banner coal producing county of the State, having stood at forefront for some years, but never before so decidedly as she does this year. Her output of coal for the year 1901 shows a total of 1,025,213 tons mined, and an increase in the production of 429,916 tons, or 72 per cent. This is certainly a very fine showing and must be very gratifying to every citizen of the county. If no unforeseen troubles arise during the current year a still further increase may confidently be expected. In the production of this large amount of coal only 17 mines were operated, furnishing a better idea of the character and capacity of the mines than could be gathered from a long detailed statement. The county produced 27 per cent. of the entire ouput of the State, and when it is remembered that there are 316 mines in the State, it can be easily seen what the 17 mines of Macon had to do and of course some of these are small, furnishing simply a local demand. During the year there were 2,102 men and boys that found employment in and around the mines. The amount received at the mines for the output was $1,042,327, showing an average of $\$1.01^{1}/_{3}$ per ton.

Powder, it will be observed, played an important part in the excavation of the coal, there being 35,912 kegs consumed which cost the miners during the year $71,824.

The same seam of coal is worked throughout the county and the room and pillar method universally practiced, except at Lingo, where the longwall system is in use. The larger mines are located at Ardmore, Bevier and Lingo, but there are a few small mines at other points operated to supply the local trade. For detailed information see notes on the mines following.

Ardmore Postoffice.

The Kansas & Texas Coal Co.: B. F. Hobart, President; F. [illegible] *Genl. Manager*, and Arthur Vail, Supt. This company owns and operates a large number of mines in this county all having shipping connection with the Hannibal & St. Joe, and Wabash Railways by switches, and are great factors in the coal production of Macon county. Ardmore is a mining camp located three miles west of Excello near the Macon county line, and a switch built from Excello connects the mines with the O'Mumma Branch of the Wabash Railroad and with the H. & St. Joe road, as the said switch has lately been extended and now connects with the latter road at Bevier. The coal company owns a locomotive engine for switching the cars to and from its respective mines.

Mine No. 57. Jas. Weeks, foreman. Mine located near Ardmore. It is entered by a slope and ventilated by a furnace. I made three inspections of all these mines since last report was issued, and found them in very fair condition. On my visit to this mine on the 9th of May I found a deficiency in the south and east entries, but upon investigation found that a new air shaft was being sunk, which would, upon completion, furnish the remedy. On my last visit to the mine, August 20, 1901, it was found that the furnace had been removed and placed in the new air shaft which had been finished. This not only made the air of the mine entirely satisfactory in every part of it, but the other conditions were equally satisfactory. This mine, like all others in the county, is operated on the double entry room and pillar plan.

Mine No. 57 Annex. This mine opened out in a hill beyond 57 proper, and the coal is hauled out through the first mentioned mine and is dumped from the same tipple as the latter, and both mines are in charge of same foreman. I discovered on my second visit that a new air shaft had been sunk, but the furnace was not built or the doors set suitable to conduct the air current for the new air shaft, and a deficiency was found in some parts of the mine on this visit, and the foreman was instructed to substitute wooden doors in place of the curtains. On my next visit to the mine I found the ventilation good and its general condition satisfactory. Coal about four feet in thickness, and worked on the double entry room and pillar plan, and extracted by blasting off of the solid. About 150 men employed at both of the mines, and receiving 60 cents for mining unscreened coal.

Mine No. 62 is operated by John Brock. It is located one mile west of Excello, entered by a drift and ventilated by a furnace with very fair results. Coal runs irregular and faulty. It is operated on same method as other mines of this company. Twenty-five men employed.

Mr. Brock is operating another mine in the same locality. This is a shaft 40 feet deep, and the hoisting is done with steam power. I inspected the mine on the 12th of July and found the air deficient; in fact, there was no system of ventilation adopted, as the mine was originally opened as a prospect to test the coal. Two efforts had been made previously to work it, but with poor success. The company is now making a final effort to see what can be made out of it before spending more money in sinking an air shaft and building a furnace; the coal is very low and faulty.

Mine No. 69 is located southeast of Ardmore. It is entered by a drift and ventilated by a furnace. A new air shaft was sunk during the past year at face of north entry, and a new furnace built, which was giving satisfaction. I made three inspections of the mine during the year and found it in excellent condition on each visit. Coal four feet thick, and worked on double entry room and pillar plan. About 40 men employed. Jas. Weeks, foreman.

Mines Nos. 70 (70 east, and 70 south,) are located a half a mile southeast of Mine No. 69. The three mines are located within a radius of one-fourth of a mile, and the coal is taken out from the three mines and dumped into cars from the same tipple. The mines are elevated above the railroad, and give plenty of fall for the coal to be screened and separated into various grades in loading cars. All three of the mines are entered by drifts and ventilated by furnaces. I made three inspections of the mines since last report was issued and found them in good sanitary condition at each inspection with the ventilation satisfactory at each mine. The coal runs irregular and faulty in some of the mines, and from three to four feet in thickness. I noticed also that the roof was very friable in places, and hard to secure with timber. The mines are operated on the double entry room and pillar plan. From 150 to 200 men are employed at the three mines, and 60 cents per ton is paid for mining unscreened coal. Peter Merron, foreman.

Mine No. 52 is located one and one-half miles west of Excello. It has a slope opening, and ventilated by a furnace. This is a new mine opened out in August, 1901. It is operated on the same method and under the same management as all the other mines of this company in this vicinity.

Bevier Postoffice.

Bevier is a prosperous mining city located on the H. & St. Joe R. R., five miles west of Macon City, and supported almost entirely by the mining operations carried on in its surroundings. There are 1,000 miners employed at the mines within a radius of three miles of Bevier. The coal belt that underlies this county embraces a body of coal almost inexhaustible. Bevier and its vicinity being located most favorably within the belt. While millions of tons of coal have been taken out and several large mines have been worked out and abandoned, yet larger mines have been opened in close proximity to the abandoned ones and are even larger producers. The city is continually growing and improving.

Bevier Black Diamond Coal Co., Wm. Brydon, foreman. Mine located one and one-half miles southwest of Bevier, and has shipping connection with the H. & St. Joe R. R. by a spur switch extending from the main track. Shaft 60 feet deep; equipped with good machinery for hoisting. The ventilation is furnished by a 12-foot fan. I made the first inspection of the mine on the 30th of August, 1900, and found the air all right. I discovered on this visit that the fan had been removed and set over the escape shaft, and was exhausting the air from the mine. The ventilative current was found coming down an air shaft at the face of the mine and traveling direct to the miners fresh and strong. Ventilation was very satisfactory on this visit. I made another inspection on the 16th of March and found the ventilation and general condition of the mine satisfactory. I was informed on this visit that the mine had changed owners and was operated by parties from St. Joseph. I visited the mine again on the 11th of May and found it in a satisfactory condition. I visited it again on the 12th of August, 1901, and found it closed down, and on inquiry was informed that the new company had bought a large tract of coal land adjoining the mine property and contemplated the opening of a new mine on it. The location was surveyed and platted at date of my last visit. I made another visit to the Diamond Mine on the 4th of December and discovered that it had resumed operations with 65 men at work, some driving rooms while others were drawing pillars with the calculation of abandoning the old mine as soon as the new mine was sufficiently developed to supply the required amount of coal to reach the demand made of the company. The new mine is located one and one-half miles southwest of the Diamond, and its equipments will be elaborately constructed and up to date in every respect, but as it will not be ready to produce any coal during the present year we will postpone its descriptions until next report.

Northwestern Coal Co., Jno. H. Bovard, general manager. This company owns and is operating two mines near Bevier, both of which have shipping connection with the H. & St. Joe R. R. by spur switches extending from the main track.

Mine No. 7, Fred Wiles, foreman. Mine located one mile south of Bevier. Shaft 55 feet deep; equipped with fair machinery for hoisting. The ventilation is furnished by a 10-foot fan with very good results. I made the first inspection on the 27th of August, 1900, and found the ventilative volume of air overloaded with work in the 3rd, 4th, 5th and 6th south entries off of the 6th east entry. The continuous opening of doors on the intake of the air at the main wheel road, was causing considerable leakage as the trips passed through, and the company was instructed to make a new air course through that part of the third south entry and change the door on the main wheel road. This prevented the leakage and greatly improved the air; but there were too many men working in that current at that date to ventilate the mine satisfactory. I made another inspection on the 20th of March, and discovered that all the entries had been stopped for some time and all the work confined to rooms and pillars. The mine at this date was operated under a lease by the Murlin Coal Co., which expired on the 1st of April, after which date the property would revert to its owners, consequently the general repair of the mine was not fully kept up, and it was not found in as good condition on this visit as formerly. I made another careful inspection on the 10th of May, and noticed that the present operators had put in two new cages and about 75 new pit cars, airways had been cleaned, ditches and dumps made, roadways corduroyed and entries timbered, and the general condition of the mine greatly improved since my last visit. The ventilation was also stronger and fresher. I made another careful inspection on the 14th of August, 1901, and discovered that all the entries had been started and more men employed. We found on this inspection that entries were driven in the direction of Mines Nos. 1, 2 and 3 which are full of water and long since abandoned. We recommended in view of the condition that every entry going east and north be stopped until the water was taken out of the abandoned mines, which recommendation was strictly complied with. I found the ventilation better than on last visit, and mine in better condition. I visited it again on the 4th of December and found the ventilation satisfactory, and the mine otherwise in good condition. The entries stopped on last visit were still standing, but learned that as soon as the water is taken out of the abandoned mines, all entries will be started, more men will be employed and the output of the mine greatly increased. Coal four feet thick, and worked on the room and pillar double entry plan. The product is shipped and consumed at points west and northwest.

Mine No. 8, George Michaels, foreman. Mine located one mile south of Bevier and connected with the H. & St. Joe Railroad. Shaft 130 feet deep, and equipped with first-class machinery for hoisting. Ventilation is furnished by a 14-foot ventilating fan, and the mine is practically and satisfactorily ventilated. I made a careful inspection of the mine on the 29th of August, 1900, and discovered that the escapement shaft had been completed, the communication between the two shafts made, and a large fan erected on top of escape shaft, forcing and exhausting alternately in summer and winter. I found at this visit that the main entries were driven in a north and south direction and cross entries east and west. The ventilation and general condition of the mine was in excellent shape at this visit. March 21, I visited the mine again, and made another careful inspection, and discovered that the ventilative current was conducted around the south side in three separate currents, and two over-casts being built on that side since my last visit. The first and second east entries off the south have separate currents, and an over-cast had been built over the main south which carries another current to the first and second west entries, while the third current passes over another air crossing and ventilates the third and fourth west entries, the two south, the third and fourth east entries, and preparations were made at this date for another current at the third and fourth west. There was only one current on the north side at this date, but preparation was made to erect an over-cast and divide the current on that side, but the air was good all over the mine. I made another inspection on the 11th of May and found it in excellent condition. I noticed on this visit that stoppings had been built at the necks of all abandoned places which is one of the best methods that can be practiced in a mine to keep the air from getting impure, as the blackdamp accumulating in abandoned places from the refuse of the mine and the decaying of timber and other organic matter coming in contact with the ventilative current will soon vitiate it, making it unfit to breathe. I hope this company will continue to close up air-tight every old room and other opening as soon as the same is finished, and that others will follow this example. I made another inspection on the 13th of August, 1901, and found the mine in a satisfactory condition. The entries were found high, wide, dry and clean, and well secured with timber. On the 5th of December I visited the mine again and made a careful examination and found it in excellent condition with the ventilation good and the mine in a fine sanitary and safe condition. The practice of closing up abandoned places was still continued, and the ventilative current was practically fresh on its returns to the up-cast, after it had accomplished its work on its long routes and ventilating 250 miners. I highly commend the management for its practical system of ventilating the mine. The coal is about four feet thick, and worked on the double entry room and pillar plan. The roof is of the soapstone variety, friable and soft, requiring a large amount of timber to keep it secure. Employment is given to about 300 hands in and about the mine. The product is consumed west and northwest.

Kansas and Texas Coal Co., Ed Vail, superintendent. This company owns and is operating two mines south of Bevier, both of which are connected with the H. & St. Joe R. R. by switches. Both mines are working on the room and pillar plan and on the same seam of coal, which will average about four feet in thickness. Both are shaft openings, and steam power used for hoisting.

Mine No. 61, Jas. Monihan, foreman. Mine located two miles south of Bevier. Shaft 126 feet deep, and equipped with first-class machinery for hoisting. The ventilation is furnished by a 12-foot fan with good results. I inspected the mine on the 28th of August, 1900, and found it in good condition with the ventilation satisfactory. The fan at this date was making 90 revolutions per minute, and was forcing 43,190 cubic feet of air into the mine in same time. This volume of air was divided at the bottom of the down-cast to the east and west, and conducted to the cross entries by the aid of doors. I made a thorough examination of all the air courses on this visit, and found them in a very fair condition, but discovered that there were too many men working in each current of air, and request was made of the company to split the ventilative current into more currents. I visited the mine again on the 22nd of March and discovered that an overcast had been erected over the straight east at the 2nd south entry, thus giving a separate current to the 1st and 2nd south entries. Another overcast was in course of construction over the 4th north entry, which would conduct a separate current to ventilate the two east entries and the 3rd, 4th, 5th, 6th, 7th, 8th south entries, while another current was furnishing air to the 3rd and 4th north and the 1st, 2nd, 3rd and 4th east entries off of the 4th north. The above-mentioned currents are all on the east side of the shaft where the largest number of men were at work. The west side is ventilated by the one current and was found satisfactory at this date. I made another thorough inspection of the mine on the 12th of August and discovered the ventilative current very much disarranged at several points, owing to defective doors, leakages in cross-cuts and curtains used in place of wooden doors. The volume of air entering the mine was found as large at this date as at the former visit, but the doors had been badly neglected, allowing the air to travel where it was not intended to pass. I found curtains hanging on main entries in place of wooden doors, and they were so torn by passing trips as to be no better than strings. The use of canvas doors on principal entries is obviously crude, and impracticable, and should be avoided when possible. All the mines of the Kansas and Texas Coal Co. are well equipped with ventilative appliances for furnishing air currents in its mines and, with the proper care and management, the mines can be kept in a healthy condition, and if a deficiency of air is found in any part of the mine, the cause must be laid to the mine foreman, for he has a sufficient volume of air furnished which, if properly conducted around the mine, and prevented from waisting, by reason of neglect to carefully guard all doors and stoppings, to answer the demands made upon it. After a current of air is delivered to the bottom of a shaft it is then in charge of the mine foreman (who is there virtually superintendent), to be properly conducted, cared for and distributed to such portions of the mine as it may be needed. He must see that the air courses are high, wide and clean, leaving plenty of area for the air to pass thruogh, that all doors are made air tight, properly hung, shut in the direction taken by the air current, kept in good repair and that every miner in the mine is furnished his full share of air. Without close attention is paid to the above requirements, the efficiency of the fan will avail nothing. On the 24th of December, I visited the mine again and made a thorough investigation of every part of it and discovered great improvements had been made since my former visit. An overcast had been erected over the second south entry on the west side, and the ventilative current divided into two separate currents on that side, and three separate currents on the east side, or five currents in all. New doors had been set in place of curtains, and the condition of the mine, as well as the ventilation, was altogether satisfactory at this visit. The company has put in an electric plant at this mine, which is used to do the undermining. The plant was put in by the Lorgan-Gardener Electric Company of Chicago, Ill., and consists of one 150 horse-power cut-off engine, with a 100 K. W. generator and five electric machines; also has capacity to operate ten machines. These five machines each cut three and one-half feet in width, and two of them cut five feet deep, and the other three machines cut to a depth of six feet. The machines at first were used to drive entries, turn rooms and undermine in all narrow work, but are now used in rooms and their work is very satisfactory. Machine runners are working by the foot, and men are hired by the day to shoot down the coal, and loaders get 27½ cents per ton for loading it. Another boiler has been put in here, which is 24 feet long, by 48 inches in diameter, with one 18-inch flue. I noticed on the last visit that the use of the exhaust well had been discontinued and a heater put in its place, into which the exhaust steam is discharged, and this heater, while saving the exhaust water the same as the exhaust well did, furnishes the water for use in the boilers about 30 degrees hotter than when used from the well. The company has built and constructetd 90 new houses, about half way between mines Nos. 61 and 66, during the past year for the accommodation and home of its employes, and have removed several others from some of their abandoned mines. These houses contain 2, 3, 4 and 5 rooms; will average a little over 3 rooms per house. It has also built a large supply store, butcher shop, school house, church and a post office. The houses are built of good material and well furnished. They are all painted in light colors. The doors, casings and borders are paneled and trimed in good taste and workman-like manner, giving this new mining town a cheerful appearance. We expect to see Keota (the name of the town and post office) yearly growing as the coal company owns thousands of acres of land in its surroundings, all underlaid by a 4-foot vein of coal, and Keota is located and built in about the center of this mining property and will continue to be a populous, prosperous and a progressive mining town for years to come. The branch switch, formerly operated from Excello to Ardmore, was extended during the past year through to Bevier and connected with the main line of the H. & St. Joe R. R., giving these mines shipping connection at both ends, more yard room and also passing through Keota.

Coal about 4 feet thick and worked on the double entry room and pillar plan. There are about 325 men and boys employed in and about the mine. The product is shipped over the Wabash and H. & St. Joe Railways to points north and west.

Mine No. 66, Robt. Patterson, foreman. Mine located 4 miles south of Bevier. Shaft 50 feet deep, and equipped with first-class machinery for hoisting. Ventilation is furnished by a 12-foot fan with excellent results, and the mine is practically and satisfactorily ventilated. I inspected it on the 29th of August, 1900, and found it in excellent condition, with the air current double the amount required by law, while the fan was only running at a speed of 45 revolutions per minute at the time. The airways were found large, clean and roomy and a strong current of fresh air sweeping around every working place in the mine. I noticed at this visit that preparations was made to divide the air to the different portions of the mine. On the 22nd of March I visited the mine again and made a thorough inspection of same. I discovered on this visit that the ventilative volume of air had been divided into five separate currents, which were ventilating that many parts of the mine. The fan was forcing at this date, and one current traveled from the bottom of the downcast to the east side, and another current was furnishing air to the 1st, 2nd, 3rd, 4th west entries, while each of the three sets of north entries were ventilated by a separate current of air, and it is the intention of the foreman of this mine to give a separate current to each set of entries, and the operation of the mine is carried on so as to accomplish that end; in order to do this, an overcast will be built at the intake of the air over the return entry for the current to pass over, and after making its rounds and furnishing the required amount of air to the two entries, the current returns and unites with the return air to the upcast.

I visited the mine again on the 12th of August and made another inspection with satisfactory results. I discovered on this visit that two more overcasts had been constructed and the ventilation was perfect.

There is now eight distinct and separate currents of air in the mine, which does away with the use of a great number of doors, and not a curtain was visible anywhere below. I consider this the most practically ventilated mine in the State. I visited it again on the 24th of December and found the condition of the mine good and the ventilation satisfactory. I noticed that the double track had been extended on the west side from the shaft bottom to the 5th and 6th southwest entries. The pit head had been raised and remodeled, a self dumping cage had been put in, a hopper, a hopper scale, shaker screen and a Phillips box car loader erected, the gravity screens enlarged to 7 feet by 20 feet, and a house built, covereing the screens and loader house, thus protecting the car trimmer from the weather. Coal from 4 to 5 feet thick and worked on the double entry room and pillar plan. From 225 to 250 men and boys employed in and around the mine.

Murlin Coal Co., W. E. Murlin, president and manager; Jno. P. Davis, foreman. This company is now operating two mines in the vicinity of Bevier, having recently purchased mine No. 2 of the Watson Coal Co. Both mines have shaft opening and are equipped with machinery, are working the same seam and under the same management.

Mine No. 10 is located about one mile southeast of Bevier on the Richards farm and has a territory of two hundred acres of coal to work out, being the last unworked piece of coal adjacent to Bevier, and, therefore, the closest mine to that little city. Railroad connection is obtained by a switch 5,000 feet in length, extending from the main track of the H. & St. Joe R. R. to the mine. Shaft 140 feet deep and equipped with first-class machinery. The engines were made by William Ellison & Son Manufacturing Co., St. Louis, Mo. Cylinders are 16x24 inches, connected direct to a 6-foot drum. The machinery is set on solid rock foundation and enclosed by a substantial engine house. The steam is furnished by two boilers 20 feet long and 48 inches in diameter, with twelve 6-inch flues, five-sixteenth steel shell, fully equipped and made by Wangler Boiler and Sheet Iron Works of St. Louis. The Bond self-dumping cage and weigh hopper is used, having a capacity for handling eighteen hundred tons of coal in 8 hours, and is considered the safest, most complete and economical dumping apparatus now in use. The Bond box car loader is also used at this mine, with capacity for handling two thousand tons of coal daily, installed for the purpose of loading box and stock cars, outside of the self-dumping cage. The mechanical loading of closed cars is the greatest stride in coal loading and handling of recent years. The Monarch, 6x14 foot platform, six ton top scale, is used and is considered the standard scale for self-dumping cages. A fifty-six foot Fairbank track scale is located on railroad track for weighing empty and loaded cars.

The engine and boiler house is under one roof, a building 50x50. Each compartment divided by proper partitions, with work shop in rear of engine room. Blacksmith and repair shop is 20x40 feet, and fully equipped with all necessary tools for making and repairing the equipment of the mine. The head house is twenty-six feet wide and fifty feet long over all, with sheave wheels fifty feet above the surface landing. The frame work is of the latest improved method. The member posts are made of two pieces of 4x12 inches for head house, and three pieces of 4x12 inches for tower posts bolted together, being used in place of the solid post of 10x12 or 8x12 inches as in the old way; the advantage being greater stability with less material. Head house and all buildings are covered with fire-proof roofing.

The sinking of shaft and building of switch was begun December 10, 1900, was completed and the shipping coal commenced on the 1st of March, 1901. A good record, when it is considered that all construction was done during the winter months. By the 1st of May main entries were driven and cross entries started on each side of shaft, and by the latter part of said month a connection was made between the two shafts and the mine had an output of two hundred tons a day. The main shaft is 7½x14 feet in the clear, with three compartments, etc. The sides are timbered with 3x6 inch white oak, and the ends with 6x6 inch white oak, and the two rows of buntings 6x6 placed edgeways. The escapement shaft is 7x10 in the clear, with manway 3 feet wide in one end, separated by solid partition and equipped with winding stairway, leaving an airway 7x7, which is equipped with a 12-foot Crawford & McCrinnon fan. Air shaft is located three hundred feet from main shaft. The ropes, cages, safety catches and all safety appliances are new and of modern improvement. I made a thorough inspection of the mine on the 14th day of August and discovered that an underground connection had been made between the two shafts and a permanent system of ventilation adopted. The ventilative volume at this date was divided into three separate currents, but as the mine is new and not extensively developed, further improvements will be made in the ventilation as the mine advances. It is worked on the double entry room and pillar plan, with double track haulage roads. The workings so far are dry and promise to continue so. The coal is of excellent quality, overlaid with good roof. The aim and desire of the management of this company has been to equip this mine in the very latest and most improved method with the view of a large output handled in the most economical and safest manner. The mine had an output of 400 tons per day at date of this visit and was increasing daily. I made another thorough inspection on the 23rd of December and found the mine in good condition and the ventilation very satisfactory. I noticed that great progress had been made in the opening of the mine since last inspection. I found about 175 men at work at this date, and the output from six to seven hundred tons a day, and it is within reason to state that if the mine had not encountered so much low and faulty coal, it would be producing a thousand tons a day at the last date. Coal shipped to market over the Hannibal & St. Joe Railroad.

Mine No. 12 is located one mile south of Bevier and is connected with the H. & St. Joe Railroad by a spur switch extending from the main track to the mine. The shaft is 85 feet deep and equipped with first-class machinery to hoist the product, ventilate and drain the mine. A 12-foot fan furnishes the ventilation with satisfactory results.

This mine was formerly operated by the Watson Coal Co., but was recently purchased by Mr. Murlin, who now operates it.

I visited the mine on the 27th of August, 1900, and found it in good condition. The ventilative current has a long circuitous route to travel, full of bends and angles, but the volume of air delivered into the mine is of sufficient quantity to furnish plenty of air to properly ventilate every part of it. The air courses are large and roomy, furnishing plenty of area for the current to travel around the mine without rubbing or encountering any friction points. I noticed that the air current is conducted direct to the miners, clean, strong and fresh and did not encounter any impurities until it accomplished its work, left the miners and returned to the upcast.

I made another inspection on the 21st of March and found the ventilation as well as other conditions of the mine fully satisfactory.

I visited it again on the 15th of August and found the ventilation good. I discovered on this visit that the main west entry had struck low coal and was stopped and the last set of north entries had been startetd. The indications at that time were that the mine would be worked out inside of a year, but since the present operators have taken charge, they have purchased more coal property, opened out new works and the mine is more productive than ever before and will continue so for years. I made the last inspection of it on the 23rd of December and discovered a pair of entries had been started in the new territory, they were being driven north and will soon connect with the west entry lately driven by the former operators. This will be used as an air course and will greatly shorten the route of the current, enlarge the volume of air and take it fresher to the miners. I found the air fully satisfactory at the new opening at this date, but the current was weak and very impure in the old workings. Great improvement was made by closing break troughs and brattices and making all stoppings perfectlv air tight. Coal 4 feet thick and worked on the double entry room and pillar plan. About 80 men employed. Ropes, cages, safety catches, covers and all safety appliances found in a safe condition. Product shipped over the H. & St. Joe R. R., west and northwest.

Watson Coal Co., Wm. Watson, president, and Wm. Rivers, superintendent. Mine located one mile northwest of Bevier and has shipping connection with the Hannibal & St. Joe Railroad by a switch 7,000 feet long, extending from the main track to the mine. Shaft 156 feet deep and equipped with first-class machinery. This is a new mine sunk and equipped in the spring of 1901. Coal was struck at the above-mentioned depth, but, unfortunately for miner and operator, the coal proved low and faulty and thousands of feet of entry had to be driven before a workable thickness was reached.

The failure to find the coal in workable thickness at this mine caused a great loss to the company as well as a disappointment to the community, as the plant is equipped with all modern machinery with the intention of making the mine one of the greatest producers in the State, and neither skill or money was spared to accomplish that end. The engines were built by the Keystone Iron Works Co. at Kansas City, Mo. The cylinders are 16x30 inches, connected to a 6-foot drum, working on first motion. Two two-flue boilers generates the steam. They are 20 feet long and 40 inches in diameter. Th machinery is set on good rock foundation and enclosed by a substantial brick house. The cages were made at the mine by the company's blacksmith. They are strongly built and are equipped with the best safety catches now in use, the invention of a blacksmith, who made the cages, self-dumping cages, a hopper scale and a shaker screen is also a part of the equipment of this plant. Everything is new and embraces all of the modern improvements. The shaft is 7x14 feet, separated into cage ways. An escapement shaft was sunk at the same time as the hoisting shaft and a stairway erected in it which will be used exclusively as an avenue of escape for the men to come out in case of an accident to main shaft. An air and a fan shaft was also sunk at the same time and a 15-foot fan set on top of same, which is enclosed by a good house. To avoid heighth and assist the efficiency of the fan an evcavation 7 feet deep was made and a substantial rock wall built from the bottom, 8 feet high on top, of which the fan rests. The fan house and casing is so constructed as to allow the fan to force or exhaust as the requirements of the mine may be. I made the first visit to the mine on the 11th of May and found the work confined to driving entries through the faulty coal, which work was pushed night and day. On the 15th of August, I visited it again and discovered that the two south entries had advanced about 600 feet and were getting into better coal, but was still low and faulty. On my tour of inspection of the mines of Bevier during the month of December, was informed that the coal was no better and the company was about tired of spending any more money; that the company contemplated the abandonment of the mine and seeking a new field. We regret exceedingly the disappointment and failure of this company after observing the extra effort made by it to open a mine which would not only have been a great producer, but a credit to the coal industry of the State. The selection of such a splendid plant and the expenditure of so much money it seems to us was deserving of much better results.

The Watson Coal Company is the oldest coal company in the State, and its management one of the most practical, and heretofore has been very successful. Mr. Wm. Watson, president of the company, is now about 70 years of age, has followed mines and mining all his life and elevated himself from the pick to his present position and standing, through his energy, honesty and business qualifications. He is practical, conservative and fair, liked and honored by all his employes, as well as all those who come in contact with him in a business transaction or otherwise, and the writer sincerely hopes that the next move of this company will be more successful for the good of the company, miners and the community in general.

Lingo Post Office.

The Helmet Mining Company, D. Finnell, manager; Chas. Parker, foreman. Mine located at Lingo and connected with the H. & St. Joe R. R. Shaft 135 feet deep and operated by machinery. A 12-foot fan furnishes the ventilation on the north side, while a furnace provides air on the south side. I inspected the mine on the 31st of August, 1900, and discovered that the air shaft sunk on the south side since my last visit had been completed. The connection made with the inside workings and a small furnace built, and the ventilation at this date was very satisfactory on the south side. That side of the mine had been abandoned for 18 or 20 years, the former operators having worked out all the coal property they owned. When the present operators took charge of the mine they purchased more coal property and began the opening of new works on it. The south side is now well timbered and practically opened out.

I found the ventilation on the north side as usual, sufficient in quantity, but very much vitiated with heat and impurities. The ventilative current at this date was traveling around the face of the workings in one undivided current, furnishing air to about 50 men. The mine is very dry, and the refuse stowed away in the gobs gets hot at times and the heat coming in contact with the air causes it to sweat and crumble and having a long route to travel gathers all the impurities of the mine on its journey. Spontaneous combustion often takes place in the gobs, creating an unhealthy as well as a very unpleasant atmosphere for the miners to work in. We recommended that the company put down another air shaft on the north side at the face of the workings, that the same be used as a down cast, and that the air be conveyed direct from it to the miners, as the following letter explains:

Jefferson City, Mo., Sept. 5, 1900.

Helmet Mining Co., Kansas City, Mo.:

Gentlemen—On the 31st day of last month I made a careful inspection of your mine at Lingo, in Macon County. The mine was found in a satisfactory condition, with the ventilation fully up to the requirements of the law. When we take into consideration that it is the oldest mine in the State now in operation, its general condition is very good. The improvements, such as cleaning, timbering and the laying of new and heavy rails on the south side, has greatly benefited the mine; these things, in connection with the sinking of a new air-shaft on the same side, under systematic management, will secure the required amount of air for properly ventilating that side so that from 125 to 250 men can be comfortably worked.

My information is to the effect that you intend to increase the output of the mine until the present product is doubled. This will necessitate a larger number of miners and require a largely increased volume of air. The required amount of air cannot be furnished the north side without enlarging the area of the fan shaft, or your present up-cast, both of which appear to be tested at the present time to their fullest capacity in furnishing the air now needed on that side. The fan shaft has now only 10 feet of area, and to ventilate 200 men, 6 mules and cover the worked-out territory, a volume of air of not less than 25,000 cubic feet per minute will be required to circulate through the mine to keep it in good sanitary condition and comply with the mining laws. To supply the amount of air needed through a ten-foot area, the volume of air would have to travel at a speed of 2,500 feet per minute, or about 26 miles per hour, and it will require a propelling force of four pounds on every square foot to attain that velocity.

I would suggest to you that you sink another air shaft on the north side in the most convenient and suitable location, to ventilate the work and remove the fan from its present location and set it up at the new air shaft. This arrangement, I think, would prove the most practical and satisfactory method of ventilating the mine. Your mine requires more air in circulation than in ordinary mines, for the reason that spontaneous combustion occurs in the refuse, or gobs, and thus causing the temperature to rise. which is not only injurious to the health of the miners, but very unpleasant as well. It will be impossible for you to ventilate many more men than you have at present on the north side without provision being made for a larger volume of air to enter the mine, and hope you will see your way clear to follow the suggestions made. I have also to call your attention to the pit head and top building; the timber in each are much worn and decayed. Would further suggest that all timber in the pit top be taken out and new timber substituted for the safety of all concerned.

Very respectfully,
CHAS. EVANS,
State Mine Inspector.

Before we made another visit to the mine the following letter was received from Mr. Finnell, the manager, and it was a very welcome letter, indeed:

Lingo, Mo., February 7th, 1901.

Mr. Chas, Evans, State Mine Inspector, Jefferson City, Mo.:

Dear Sir—If you are up this way again soon would be pleased to have you call and look over the mine and note improvement made in ventilation, haulage roads, etc. Since your last visit we have sunk the new air shaft suggested by you, making a downcast of same, thus giving the miners the benefit of pure air at the face of the work. Think we can safely say that our mine is now as well ventilated as any in the State.

Are now working about 125 men and working every day.

Hope soon to be in shape to carry out your suggestions in regard to new pit head and top works.

Yours truly,
D. FENNELL.

My next visit to the mine was on the 1st of May, when we discovered that another air shaft had been sunk on the north side near the face of the workings, which was used as a down cast, and we also discovered the volume of air was divided into three separate currents. The foreman of the mine had prearranged a system of ventilation for the future which, if properly carried out, will prevent any further deficiency therein. As soon as the air shaft struck through, the temperature dropped 60 degrees at the bottom of it, and those working in the immediate surroundings of the new air shaft had to wear their coats and gloves during the cold months, while previous to this every miner working in the mine worked without a shirt on. The ventilation at this date was stronger, fresher and purer than on any previous visit, and was very satisfactory. The air on the south side was also good. I noticed on this visit that the wheel roads had been reconstructed, the track *relaid with heavier rails*, the entries retimbered, and while it is the oldest mine in the State now in operation, it is also one of the best ventilated. I made another inspection on the 17th of August and found the ventilation and all other conditions around the mine satisfactory. On the 30th of December I visited it again and I found the air and inside workings in a satisfactory condition, but we were dissatisfied with the pit head and top buildings, which are old, rotten and in a dangerous condition. We requested the company to reconstruct and rebuild the whole structure with new material. The coal is about 4 feet in thickness, but there is a bench rock from six to ten inches thick within a foot of the bottom running regular througout the mine. It is worked on the longwall plan. From 125 to 150 men and boys employed. The product is consumed by the proprietors of the mine, the Armour Packing Company at Kansas City.

There are quite a number of local mines operated throughout the county during the fall and winter to supply home demand, and all particulars concerning them will be found in the statistical table of Macon county, embodied in this report.

MONTGOMERY COUNTY.

Wellsville Post Office.

Very little mining is now being done in this county, although the coal seam runs under the whole county; yet it is low, irregular and faulty. The few mines operated here during the past year are located in the surroundings of Wellsville and were worked during the winter months to supply home demand. Name of operator and output of each mine can be found in the statistical table of the county in this report.

MONROE COUNTY.

The mines operated in Monroe county during the past year are located near Paris. The Coal seam is about 18 inches thick, and the mines are worked only a few months in winter to supply the local demand. This seam crops out on the hillside and the mines are entered by drifts. Further information will be found in table of this county.

MORGAN COUNTY.

Hubbard & Moore operate a strip mine near Versailles. The coal is about 50 feet in thickness and mixed, of the cannel and bituminous varieties. This is a coal pocket, or an isolated deposit of coal which occurred below the margin of the coal measure area.

Thirty-six years ago, when the writer first came to this State he started to work in one of these pockets at Elston, in Cole County, and the product of the mine at that time was hauled from the mine to the railroad at Elston station and was consumed by the Pacific Railroad Company on their engines. Two-thirds of the coal production of the State at that time was taken from coal pockets, which were extensively worked in Cole, Cooper, Miller, Moniteau and Morgan counties, and a large number of isolated coal deposits still remains undiscovered, but since the regular coal seams of the State haveen so developed and large mines opened out very little attention is now given to coal pockets.

NODAWAY COUNTY.

Production, 2,000 tons.

Quitman Post Office.

Mining has been prosecuted in the vicinity of Burlington Junction and Quitman for a great number of years, but only in a limited way to supply home demand. The coal seam is thin and varies in thickness from 14 to 20 inches. The mines are entered by vertical shafts, varying in depth from 20 to 72 feet, and the product is hoisted out by horse power. All other information concerning parties operating mines in that locality, and output of same, will be found in the table of the county in this report.

PETTIS COUNTY.

Hughesville Post Office.

George Menefee is now operating the Carson mine. This mine is located two miles from the depot, and the coal is taken away in wagons. The mine is entered by a vertical shaft 65 feet deep, and the product is hoisted by steam power. Coal 34 inches thick and worked on the room and pillar plan. About 10 men employed in winter and 4 in summer. Product consumed at Sedalia and vicinity.

Lamonte Post Office.

Shanks & Carson Coal Company. This company has opened out a mine lately two miles east of Lamonte on the Mo. P. R. R. They have sunk a shaft and struck 24 inches of coal at a depth of 50 feet, and intend to operate the mine on the longwall plan and haul the coal in wagons to Sedalia, as there is no railroad connection.

PUTNAM COUNTY.

Production, 218,862 tons.

Putnam county is ranked among the large coal producing counties of the State, and shows an output of 218,862 tons during the past 18 months (this report covering that period). The principal mines of this county are located at Blackbird, Mendota and Unionville although there are smaller mines in operation at other places, but their output is very small, and are operated only during cold weather to supply home trade. The county is largely underlaid with an excellent vein of coal which crops out in the hillsides, and the mines are easily operated by drifts. There are other workable veins of coal underlying this one, which has been discovered in the eastern portion of the county, which are 20 inches and 26 inches thick respectively. This coal underlies, we believe, the entire county, but will not be worked likely so long as the seam of coal now mined lies so convenient for operation. The mines of this county are properly operated, mostly dry, safe and healthy. During the period covered by this report 218,862 tons of coal were mined, the product of 16 mines employing on an average 698 men and boys in and around the mines. For the detailed information relating to the respective mines, see table of this county, and the following for the description, location and condition of the same.

Blackbird Post Office.

Blackbird Block Coal Co. Sam Moss, superintendent. This company is now operating two mines at Blackbird, both of which have shippng connection with the C., B. & Q. R. R. Mine No. 1 is a shaft 53 feet deep, and equipped with steam power for hoisting. Ventilation is furnished by a 12-foot fan, whch was giving very poor results, considering the capacity of the mine as compared with the size of the fan; this is caused by small and choked up air courses. We have been familiar with the underground work of this mine from its start, and its former superintendent has received from us much good advice, especially with reference to a proper any systematic system of ventilation, impressing upon him the necessity for keeping his air courses clean; but all efforts of ours appears to have been to no purpose, as he (Mr. Wm. Love) went ahead in his old way, never heeding until at last he was forced to give up. Since then there have been several persons in charge of the mine, who have done their best with it.

I made an inspection on the 26th of October, 1900, and found the ventilation better than on former visit. In fact, it was satisfactory to the few men employed. The present foreman had cleaned up some airways and set a few doors, which left the mine in fair condition. I visited the mine again on the 3rd of May and found it idle; hence no inspection. I returned on the 8th of November and discovered the method of mining had been changed from the room and pillar to the longwall plan, and found the ventilation rather weak and sluggish, while there was no deficiency discovered, yet the current was hardly up to the requirements of the law. The mine makes considerable water, keeping the roadways wet and muddy. Coal 33 inches in thickness, with clay parting running through it from 2 to 3 inches in thickness; 40 men employed, and 83¾ cents paid for mining. Product consumed at St. Joseph and northwest.

Mine No. 2 is a slope opening and the coal is brought to the surface by machinery. It is located ¼ of a mile southwest of Mine No. 1 and the same coal seam is worked at both mines. This is a new mine opened out and equipped during the past summer, and at date of my visit, Nov. 8, preparations were being made to commence shipping coal. An air shaft had been sunk, but no underground connection had been made at this date and a permanent system of ventilation had not been adopted. Both mines are under the same management.

Mendota Post Office.

Mendota Coal Co. F. B. Ketchum, president, and B. H. Johnston, superintendent. This company ownes and is operating two mines in the surroundings of Mendota, and both have shipping connection with the C., B. & Q. R. R. by a spur switch extending from the main track to the mines. The same coal seam is worked at both mines, which is from 32 to 34 inches in thickness, separated into two layers by a clay band from one to two inches thick running regularly below the center of the coal. The roof that lies over the coal is a hard lime rock, but there is a layer of black slate from 8 to 12 inches directly next to the coal which makes the conditions for both coal and roof well adapted for longwall or room and pillar methods of working, and both plans are practiced in one of the mines. Where the room and pillar system is practiced the entries are driven double with cross-cuts at intervals of 50 feet apart, and double rooms are turned off each entry and carried 40 feet wide, with a wheel road on each side and two men in a room. The air is conducted in on one road around the face of the room and out the other, proving a satisfactory as well as a practical way of ventilating. Wooden doors are set at entries and at the mouth of rooms and great care is taken of the ventilative volume of air to have it properly arranged and conducted in sufficient quantity to the miners. Both of these mines are dry, safe and clean; are properly operated and practically ventilated.

Mine No. 2. Wm. Tippitt, foreman. Mine located two miles east of depot. It is a shaft 63 feet deep and equipped with first class machinery for hoisting. The mine is ventilated by a 12-foot fan, which was giving satisfaction at dates of inspection. I inspected the mine on the 27th of October, 1900, and found it in a very fair condition, with the ventilation good all over the mine with the exception of a few rooms in the longwall work on the west side, where preparation was made to secure an outlet for the return of the air on the north entry. The air on the east side and all the work off the south entry of the east was entirely satisfactory. Indeed, I noticed several inprovements which had been made for the betterment of the ventilation since my former inspection by resetting doors, cleaning air courses, filling up abandoned cross-cuts and making all stoppings air tight. I made another inspection on the 4th of May and found the ventilation satisfactory in every part of the mine; an outlet for the return air had been made on the west side, making the air good in the longwall workings. I discovered the current stronger on the east side and on investigation found that the air course between the straight east and the first off of the north entry had been cleaned and enlarged, causing a larger volume of air to pass through, and as this air course is intended for the return of the air that is conducted through the east side, the whole mine on that side was greatly benefited by the enlargement of said air course. Another careful inspection was made on the 7th of November with satisfactory results. I discovered that considerable improvement had been made in the ventilation since my last visit by cleaning and enlarging airways and shortening the route of the air currents. I found the volume stronger, larger and fresher at the face of the workings than even on my last inspection. I also discovered that an east entry was driven on the east side off of the first south entry to connect with the third south entry off of the straight east, which will shorten the route of the current 1,000 feet when through. A west entry was also in course of construction from the second south entry on the west side to connect with face of the longwall work for a permanent intake of the air for the longwall workings, and when these connections are made the ventilation at Mine No. 2 will be perfect. Every effort is made by this company to comply with the mining laws and to operate its mines with a view to safety and the health of its employes. There were 105, 125 and 165 miners employed respectively at dates of inspection, besides 11 mules and 15 day hands. Coal taken to St. Joseph and points north and northwest.

Contract Mine No. 7 is operated by S. Medlin and is located about one mile southeast of depot. Mine entered by a drift and ventilated by a furnace. This is a new mine opened out during the past year. The coal seam is the same as that worked at the other mines arround Mendota, and the mine operated on the longwall system. There were 23 men at work at date of inspection. The product is taken to market over the C., B. & Q. R. R. 83¾ cents per ton is paid for mining run of mine coal.

Contract Mine No. 9 is located ¼ of a mile west of the depot and is operated by the Arnold Bros. Mine entered by a drift and ventilated by a furnace. This also is a new mine opened out last fall and it had 18 men employed at date of my visit, November 6th. Thickness of coal is the same as that at other mines in this locality, and the mine will be operated on the room and pillar plan. The coal at present is hauled from the mine in wagons, but a switch will be built by the C., B. & Q. R. R. from main track to the mine.

Mine No. 8. Ed McCullom, foreman. Mine located half a mile southeast of depot, and connected with the railroad by a spur switch. The mine is entered by a drift and ventilated by a furnace with excellent results. I made the first inspection of this mine during the past year on the 27th of October, 1900, and found it in a satisfactory condition, with the ventilative current double the amount required by the law, and which was properly conducted around the workings. I made another inspection on the 3rd of May, 1901, and found the mine in good condition and the ventilation satisfactory. I visited the mine again on the 6th of November and made a thorough inspection, and as on all former inspections found it in good condition, with every feature satisfactory. I found the air courses large, clean and roomy; all doors set at proper places, well hung, kept in good repair and trappers employed to attend same. All entries are high, wide and clean, with good wheel roads, all laid with a heavy rail, making this a first class mine in every respect, and the greatest of care is taken by the foreman to keep it in first class order. Driving entries and all other necessary improvements in and around the mines of this company is done during the slack times in summer. and when the fall and winter trade opens the mines are in condition to put in men and supply the demand. Coal 33 inches thick and worked on the room and pillar plan. About 90 men employed, and 83¾ cents per ton paid for mining.

Rodgers Bros. Coal Co. Mine located ½ mile northwest of depot. It is a drift opening and the ventilation is furnished by the aid of a furnace with poor results. I discovered on my last visit that the airways had been choked up with dirt, thus retarding the air current. The company was requested to clean them up and secure by proper methods better air in the mine. Coal 33 inches thick, and worked on the room and pillar plan. About 20 men employed, receiving 83¾ cents per ton for mining. Coal taken away from the mine in wagons, loaded on cars at switch and shipped over C., B. & Q. R. R.

The Star Coal Co. is operating a mine in the same locality. It is entered by a drift and ventilated by a furnace; the same seam is worked here as in the other mines around Mendota. About 10 men employed.

There are 10 or 12 other parties in the surroundings of Mendota operating small mines during the fall and winter to supply local trade. The coal seam underlies nearly the whole county and crops out on the hillsides and apparently every farmer has a coal mine on his farm, and never goes to town in cold weather without taking a load of coal with him, and hundreds of tons of coal is thus taken out without a record being made.

Unionville Post Office.

Standard Coal Co. C. E. Dodge superintendent. Mine located 1½ miles north of Unionville, and connected with the C., B. & Q. R. R. Shaft 110 feet deep, and equipped with good machinery for hoisting. The ventilation is furnished by a 10-foot fan with good results. This mine was formerly known as the Emporia Coal Co., and was bought by the present operators some time during the past summer, and is now operated more successfully. On my regular tours of inspection to the mines of Putnam county I made two visits to this mine and found it idle; the men were on strike for their pay; but that trouble is over since the present operators took charge. The method of mining is also changed from the room and pillar to the longwall plan, which, we think, is a mistake and that it will prove a failure on account of faulty coal and shallow covering, and that the company will find its error after some expense. The ventilation was rather slack in parts of the longwall work at date of last inspection, November 8th, but preparation was being made to connect the straight west with the north off of the west, which, as soon as through, will shorten the route of the current 2,000 feet and the air then will be satisfactory. The same seam is worked here as at all mines in this county; 40 men emploed. The product is shipped north and northwest.

RANDOLPH COUNTY.

Production, 432,655 tons.

This is one of the largest coalproducing counties in the state, ranking third in the order of output, having advanced from fourth place within the year.

Coal is known to underlie, and in fact mining has been prosecuted, in its every township, but active operations are confined to the territory bordering the Chicago & Alton, M., K. & T. and Wabash railroads. While millions of tons have been transported over the above named railroads to distant markets, yet the body of coal remaining is so extensive by comparison as to make the amount taken out appear trifling. With its four (4) feet vein of coal covering so extensive an area, with the number of new mines opened each succeeding year and the extensive improvement and enlargement of its older mines, the revenues from this industry must continue to increase year after year for a very long period of time.

The 432,655 tons of cole mined during the year sold on an average at the mines for $1,11 per ton, making the value of the output $480,745. In producing the above amount 20 mines were operated and employed throughout the year an average of 895 men and boys in and about the mines.

Following will be found a description of the respective mines, together with their condition at dates of inspection:

Elliott Post Office.

Elliott Coal Co. J. C. Fleming, manager and superintendent. This company ownes and is operating 3 mines in the surroundings of Elliott, all of which have shipping connection with the M., K. & T. R. R.

Mine No. 3. J. Deholder, foreman. This mine is located at Elliott. Shaft 145 feet deep, and equipped with good machinery for hoisting, and the ventilation furnished by a 12-foot fan. Four inspections were made of this mine since the last report was iss and it was found in a very fair condition at each inspection. I made the first inspection on the 18th of October, 1900, which date I discovered that men were at work cleaning out what is known as the Renick entry with a view to making a connection with the workings on the south, which will shorten the route of the air and make it fresher and stronger. I found the ventilation on the southeast part of the work very good and the general condition of the mine was satisfactory. April 4th I made another inspection and found that all the work on the north side had been stopped and the men put to work on the south side. The connection had been made between the Renick entry and the other part of the workings from the south; the air courses had not been fully widened out at this date, but the ventilation was better than on the former visit. The face of the work was in better condition on this visit than any former one, as I could walk along the face without a check, thus giving an open way for the air to travel in, and proving very satifactory. The hoisting ropes, it was noticed, were badly worn in a few places and the attention of Mr. Fleming was called to the matter. He replaced them with new ropes at once, and at the same time put on new springs and repaired the safety catches. I visited the mine again on the 23rd of May and found it in excellent condition.

On the 3rd of October I visited the mine again and found the ventilation good and the safety appliances in good working order, and the general condition of the mine satisfactory. Coal 4 feet thick, and worked on the longwall plan. From 80 to 100 men employed. The product is consumed by the M., K. & T. R. R. Co.; 10 chutes have been erected at the mine to coal engines.

Mine No. 4 is located about 3 miles southwest of Elliott, and about same distance west of railroad. The coal is hauled to the railroad from the mine over a tramway by a small locomotive and pulled over a trestle by machinery, dumped into cars and shipped over the M., K. & T. R. R. The mine has a drift opening, and the ventilation is furnished by a furnace. I made 4 inspections of the mine since last report was issued, namely, October 20, 1900, April 17, May 24 and on the 2nd of October, and found it in good condition at each inspection, with the ventilation satisfactory. The coal varies from 4 to 5 feet in thickness, and worked on the double entry, room and pillar plan. It is overlaid by an excellent shale roof, easily secured by timbering. Employment is given to 60 men, and 60 cents per ton is paid or mining unscreened coal. The product is mostly used by the R. R. mpany.

During the latter part of the year 1901 this company sunk another shaft ¾ of a mile southwest of Elliott and about the same distance north of the railroad and equipped it with a new plant, embracing all the modern improvements. The sinking of shaft, building of a switch about 6,000 feet long to connect with the M., K. & T. railroad and the construction of pit head, weighhouse and the setting of machinery was commenced about the latter part of September, 1901, and by the 1st of January, 1902, the mine commenced to hoist coal. The shaft is 135 feet to the coal, and curbed with 3 inch by 10 inch white pine. It is 7 feet 6 inches wide by 15 feet long, partitioned off into 3 compartments, one of which is used as a temporary air chamber, while the other two are used for cageways. We discovered that guides were built of 3 thicknesses of 2 by 6 inch, white pine, which makes a smoother guide and less liable to warp, or joints to become loose than the solid timber. The hoisting machinery consists of a pair of engines built by the Ottumwa Iron Works of Ottumwa, Iowa, with twin cylinders 14 inches in diameter by 30 inch stroke, connected direct to a 4½ foot iron drum. This drum is all in one with 7-foot face, having a powerful post-brake in the center which is operated by a treadle and is capable of holding the engine and its load against a full head of steam.

Steam is furnished by two boilers, one of which is 18 feet long by 60 inches in diameter, with 46 four-inch tubes and a full front 11 feet high with a 50-foot smoke stack; the other boiler is 16 feet long and 40 inches in diameter with two 15-inch flues, breech front and 30 feet smokestack. Both boilers were built by the well known firm of John O'Brien of St. Louis. The steam connection from these boilers to the engine passes through the ceiling and floor of the engine room and a globe valve is placed within easy reach of the engineer to be used in emergencies. An automatic lubricator and a steam gauge is also set on this pipe inside the engine room. The exhaust steam from the machinery is conducted into a condensing well, from which it is used again in the boilers, which not only disposes of the blinding volumes of steam, but saves one-third of the amount of water required, besides making a great saving in fuel. The machinery is all set on solid rock foundation and enclosed by a convenient and commodious building. The engine and boilers are under the same roof and are in the same house, which is in the shape of the letter T. The whole building is 44 feet wide by 66 feet long, partitioned off into separate compartments. The boiler house is 24 feet wide by 36 feet long, and the engine room is 20 by 30 feet, with 10-foot ceiling and entirely separated from the boiler room by partition. A blacksmith and a machine shop are also provided at the mine and equipped with power punch drill press, cutter saws, forges, formers for pit car iron, and all other tools necessary to keep up the repairs of the mine and the machinery. The smith shop is 16 by 20 feet, and the machine shop 16 by 22 feet. All buildings are covered with magnesia flexible cement, a fire proof composition prepared by the Phillip Carey Manufacturing Company of St. Louis, Mo., and painted with asbestine, also considered fire proof. The pit head or tower upright posts are framed each of one solid piece 56 feet long. The tipple is framed of 10 by 10 inch white and yellow pine, and the dumping and screening arrangements rest on solid rock foundations. The head house is 30 feet wide at bottom, battered to 20 feet wide at coal landing and is 55 feet long. The height of pit top from ground to coal landing where coal is dumped is 32 feet, 51 feet from surface to the journals of the pulley wheel and 60 feet to top of tower. The coal is discharged from automatic cages into a hopper pocket which is suspended from scales overhead by six one-inch rods. Here the coal is weighed and released into the gravity screens by a foot treddle operated by the weighman. The hopper is 12 feet wide at upper end, tapering to 7 feet at lower end. There is a trap door constructed at the bottom of the hopper which can be rased by the topman to let dirt through to be dumped into a dirt car which can be run under it: this is one of the fuirts of the inventive mind of Mr. Fleming, the superintendent. These screens are so arranged that lump, nut, steam, slack and mine run grades can be loaded separately, and three tracks are provided for the different grades. The screens are so arranged also that mine run is made by dropping two steel doors over the larger bars, thereby passing the entire box of coal over into the car on the outer of scale track. The steam is made by hooking up a small sheet at foot of nut bars so that the nut is turned back into the slack car, or if this sheet is turned down the nut will pass into the nut car, and the plain slack will run into the slack car. The cages were built by the Ottumwa Iron Works, are strongly made and equipped with the latest improved safety catches. The hoisting ropes are one and one-eighth inches crucible steel, made by the Brodrick & Bascom Rope Co., and the sheaves are made of solid cast with deep grooves lined with wood and are 54 inches in diameter. The escapement shaft was down 110 feet at time of writing these remarks. It is 5 feet wide and 12 feet long, located 325 feet from hoisting shaft, and as soon as it is completed it will be separated into two compartments, one of which for the air passage way proper, will be 5 by 8 feet, and a stairway will be built in the other compartment. A 12-foot ventilating fan will be erected on top at once. Very little mining had been done at the mine up to the time of this writing, but as far as the entries are driven the coal runs level and uniform, averaging about 4 feet in thickness, overlaid with sandy soapstone and underlaid by the usual fire clay. The mine will be operated on the double entry, room and pillar plan, and as planned and equipped we expect to find it a great factor in the coal production of this county in the near future. We will be able now, after having minutely described the equipment, more fully describe the inside workings in the next report. Robt. Moss, foreman.

Higbee Post Office.

Higbee Coal Company. Wm. Walton, manager and superintendent. This company ownes and is operating two mines in the vicinity of Higbee, both of which have shipping connection with the Chicago & Alton railroad. Both mines are working the same seam of coal, which varies from 3 feet 6 inches to 3 feet 10 inches in thickness. Both are shaft openings, and steam power is used for hoisting at each mine.

Mine No. 1. Hiram Hyde, foreman. Mine located ¼ of a mile west of Higbee. Shaft 170 feet deep, and ventilated by a 10-foot fan. A careful inspection of this mine was made October 19 and the mine found in a very fair condition. The air on the east side was fresh and strong at every point, but several checks were found on the west side which were causing great derangement in the ventilation. All the work is confined to the north side of the shaft, and the ventilative volume of air is conducted around the mine in two currents, one current ventilates the east side, while the other furnishes air for the west side, and the two meet at the face of the north entry, from which place the air current returns to the up-cast. The current travelling to the west passes over the return air through an air crossing and thence travels on the west entry to its terminus and returning through the face of the workings on the north entries. Owing to the long route this current has to travel and through some small and contracted airways, I found it very much overloaded with work and the company was requested to open out all places where falls were encountered and enlarge the air courses. This mine is very dry and the dirt stowed away in the gob heats and sometimes spontaneous combustion takes place, and when the heat comes in contack with the air it becomes so hot as to make it not only very *unpleasant for the* miners, but detrimental to the roof which sweats and crumbles from the effect of the heat. At the face of the longwall work, where the unavoidable falls and squeezes occur, great annoyance to the management results, as they are of frequent occurrance and invariably have the effect of interfering with the free and uninterrupted passage of the air.

April 24th I made another inspection of this mine, and as on my former visit I found the ventilation satisfactory on the east side, which was mostly worked on the room and pillar plan at this date. On inspecting the west side I discovered that the demand for coal had slackened up and the mine was only working a day or two a week. During the winter months the demand was greater than the mine could supply and the company opened new work and employed all the men it could put on, but the latter part of March the demand for coal fell off to such an extent that a large number of the miners left for other mines, leaving two-thirds of the rooms vacant. Any part of these mines while standing idle will heat and sweat, the roof will crumble and fall. A condition of affairs like that is a great disadvantage in the operation of this mine. When the mine works steady and the coal face moving every day there is no difficulty in conducting the air satisfactorily around; but when there is 2,000 feet of face opening and the mine only running a day or two a week with the roof of a friable nature it is next to impossible to conduct the air in a satisfactory manner around to every part of it. I made a thorough inspection of the mine again on the 16th of July, and as on former inspections found the ventilation on the east side satisfactory. I inspected the mine again on the 22nd of August and found the ventilative volume of air sufficient in quantity, but overeloaded with work and very much vitiated with black damp, plainly showing the inefficiency of the fan to furnish the air in sufficient quantity and quality to justify the demands of the mine. In the latter part of September I visited the mine again in company with Mr. Walton, and after a thorough investigation readily realized the necessity of sinking another air shaft nearer the face of the work, same to be used as a downcast, and at the time of this writing said shaft is nearly down to the coal and when completed the air connection will be made at once and make the ventilation at this mine satisfactory. Coal 45 inches thick and worked now altogether on the longwall plan. From 100 to 150 men and boys employed. The product is mostly consumed by the R. R. company; 10 chutes have been erected here to coal engines.

Mine No. 2 is located two miles east of Higbee. Adam Young, foreman. Shaft 125 feet deep, and equipped with first class machinery. This is a new mine sunk and equipped during the fall and winter of 1900, and at date of first inspection on the 18th of December, 1900, it had commenced the shipment of coal. Shipping connection is obtained with the Chicago & Alton railroad by a switch. The machinery and equipments of this mine are all new and of modern improvement. The engines were built by the Riverside Iron Works Company of Kansas City, Mo., with twin cylinders 14 by 24 inches connected to a 5-foot drum, working on first motion, and the steam is furnished by one two-flue boiler at present 30 feet long and 44 inches in diameter. All the machinery is set on solid rock foundation and enclosed by a commodious building. The boiler house and engine room are under the same roof and partitioned off into proper compartments, the engine room being entirely separate from the boiler room. The pit top or head gear is 48 feet from ground to pulley wheels and 32 feet to coal landing. The head house is 26 feet wide by 40 feet long, constructed with every convenience for handling a large tonnage of coal with great rapidity. The coal is discharged from a self-dumping cage to a hopper and weighed on a hopper scale, which is well constructed, hung and resting on posts entirely separated from the top building and on rock foundation and is the only scale constructed on this plan in the State. The door hook on the hopper to let out the coal is worked and regulated by steam and very convenient. The coal is thus delivered into a shaker screen, which screen grades the coal into different grades and sizes, and different tracks are provided for each grade. The shaker screen works on a pendulum motion at an elevation of about 18 degrees and the screen operated by an independent engine of 10-horse power. The weigh house and other appliances for the speedy, convenient and economical handling of a large tonnage of coal are models of neatness and usefulness. The cages are new, strongly built and supplied with the latest improved safety catches. New hoisting ropes were also added to the equipment of the plant, making it one of the best constructed plants in the State. The escapement shaft was sunk soon after the main shaft, and is divided into two compartments, one of which is for air, while a stairway is built in the other compartment for the men to travel. A 14-foot ventilating fan is built at the escape shaft and is operated by a 10 by 12 inch cylinder, horizontal engine connected directly to the fan shaft, and capable of producting one hundred cubic feet of air per minute in the mine. The fan house and casing is constructed by a system of doors so that the fan can be made to force or exhaust the air as the requirements of the mine may be without stopping it. On entering the mine on my first visit I noticed that Mine No. 2 had one of the best bottoms in the State, and the work on it has been performed in a workmanlike manner, with plenty of room for men and mules to move around without confusion. The coal is all caged on one side of the shaft and all the empties taken out on the other side, thus affording the handling of a large tonnage with the greatest of ease and rapidity. There is a diversity of opinion among practical coal and mine men as to which is the best and cheapest plan, the one practiced at this mine or the old system of handling coal on both sides of the shaft, and the writer much prefers the plan adopted at this mine for various reasons. The mine was opened out on the room and pillar plan, and the underground work contemplated that entries be turned at right angles from main entries and that an overcast was to be constructed about 300 feet from the shaft bottoms after the mine is developed further. This plan will furnish two separate currents of air on each side or four currents in all. I also noticed from the plan that each set of cross entries can be ventilated separately if necessary, and the mine as planned and equipped will soon be a great factor in the coal production of this country. The shaft bottom is timbered with large, substantial timber and all practically set. The double parting is extended 200 feet on the west side and about the same distance on the east side and all laid with heavy iron. I made two more inspections of the mine and found it in excellent condition, with the ventilation satisfactory. I noticed on my last visit that the system of mining had been changed from the room and pillar to the longwall, which will likely prove the more successful method of mining this seam. Coal 42 inches thick, and overlaid by good slate roof. The coal is shipped to Kansas City.

Interstate Coal Co. Wm. Walton, Superintendent; David Bomen, foreman. Mine located one and one-half miles south of Higbee, and connected with the M., K. & T. R. R. Shaft 110 feet deep, and equipped with first class machinery for hoisting. The ventilation is produced by a 12-foot fan, which runs at a speed of about 90 revolutions per minute with good reults. This mine was closed down in June, 1899, by request of the miners organizatiion and remained closed until the latter part of October, 1900, during which time it suffered considerable damage by falls and caves, and the mine would have remained closed indefinitely but for the activity and interprising action of Mr. Wm. Walton, who leased the property from the owners and is now operating the mine. The former operators of this mine became disgusted with the action of the leaders of the miners organization in closing the mine when they had signed the scale, complied with every request and demand of the organization and were only supplying their own customers with coal. The operators having been denied the right to operate their mine in accordance with the arrangements previously agreed to between them and the organization preferred to quit the business and close the mine rather than operate under such unsatisfactory conditions.

After spending considerable time and money in cleaning and putting the mine in condition again, it started to ship coal in November, 1900. I visited and made an thorough inspection of the mine on the 12th of February, 1901, and found that the air courses on the north entry off the east had been cleaned and the air was passing through that portiion of the mine in a very satisfactory manner; but I discovered a few places on the south entry that had not yet been fully cleaned and the 'ventilation was defficient; at the time, however, preparation was being made to make another air connection and remedy the evil. I made another inspection on the 25th of May and found the ventilation satisfactory at every point and the mine otherwise in good shape. I returned on the 1st of October and made another careful inspection. The ventilation at this date was satisfactory in the north part of the mine, and a good current of fresh air was found passing along the face of the work. The ventilation was very good on the south side also at this date, with but one exception, and as soon as the connection could be made between the 4th and 5th south entries the defect would be remedied. The general condition of the mine at this date was satisfactory, and noticed that it is rapidly recovering from damages sustained while it remained idle. Coal 45 inches thick and worked on the longwall plan. There are about 100 men and boys employed; 85 cents per ton is paid for mining merchantable coal. A large portion of the product is consumed by the R. R. Co.

Huntsville Post Office.

Morris Bros. Coal Company. James Orris, superintendent. Mine located one mile east of Huntsville, and has shipping connection with the Wabash railroad. Shaft 100 feet deep, and equipped with first class machinery for hoisting. This is a new mine, with shaft sunk during the spring of 1900. Commenced shipping coal in August of same year, and at date of inspection, September 8, it had a large output. The mine is equipped with all modern improvements. The engines were built by the Riverside Iron Works of *Kansas City. The* cylinders are 10x16 inches, connected direct to a 4½-foot drum. The pit head and top buildings are all new and well constructed, furnishing every convenience for the handling of coal. The machinery is set on good rock foundation and enclosed by a substantial house. The cages are new and well built, and are supplied with good safety catches; new hoisting ropes have also been put on, all of which makes it a well constructed plant. At date of first inspection I discovered that the main entries were driven north and south, and cross entries east and west and that connection had been made all around for the ventilation, and a fan set at one end of hoisting shaft exhausting through an air chamber partitioned off for that purpose. It was giving satsifaction as far as furnishing air was concerned, but the law requiring two separate outlets, separated by natural strata of not less than 300 feet in breadth for a safe avenue of escape for the employes in case of accident. The company was notified to comply with the law and sink an escapement shaft at once, which instructions I am pleased to state were immediately complied with. I visited the mine again on the 26th of March and made a thorough inspection. I found the escapement sunk and completed; the connection made with the inside work and an excellent stairway built for the men to travel in and out of the mine. The fan still set on the side of the hoisting shaft where it was on my former inspection, and was giving excellent results. The ventilative volume of air travels around the mine in two currents as it is divided at the bottom of the down cast to the north and south, and an abundance of fresh air was found passing around every part of the mine. I discovered also on this visit that the mine had been extensively developed since last inspection and had an output of 25 cars a day at this date. The entries had been brushed and securely timbered and the general condition was first class. I made another visit on the 19th of July, but the mine not being in operation and only a few day hands at work making repairs, no inspection was made. I returned on the 29th of October, and made a careful inspection and found the mine in good condition and the ventilation fully up to the requirements of the law, but so much over loaded with work as to make it unfit to breathe. I discovered 232 men and boys working in the mine with only two currents of air, and to make matters still worse, fully 200 shots were fired at noon every day, thus making the fumes and smoke so dense and thick that the miners could not see their own lights for two hours in the afternoon. I instructed the management to clean and enlarge some of the airways, change some doors and construct two over casts on the south side and divide the volume of air into two more currents. We also advised the miners to abandon the custom of firing at noon, and adopt a rule to fire shots only at night. A miner can dig more coal, use less powder by this rule than by firing twice a day and he will feel a hundred per cent. better in going out of the mine every evening. And we are convinced it would be very much to their interest to adopt it. I visited the mine again on the 12th of November and found that some of the air-courses had been cleaned, one door changed and on over cast built over the south entry at the 2nd west, thus ventilating the first and second west entries by a separate current which was coming down the escape shaft, and adding that much more to the ventilating current. We noticed that another overcast was in course of construction on the south entry at the 4th west which was to be completed in a few days. This would make four separate and distinct currents of air. We noticed, also, on this visit that the airways on the east side were very much choked up with dirt, thus retarding the air very much. The management was instructed to clean them at once. In response to a complaint from the local union of a deficiency in the air, we visited the mine again on the 31st of December, made a thorough inspection and was accompanied through the mine by the pit committee, and the mine was found in excellent condition. Test of the air was taken on the south side, and 25,760 cubic feet found passing on that side where the largest number of men were at work, and 17,400 cubic feet was shown to be passing on the north side. The air was passing around the mine in four currents, and were very evenly divided except the last current on the south side which was a little over loaded. All the air-courses had been cleaned so that we could walk through with ease. We found too much use made of curtains where wooden doors should be used. We also found that the pernicious habit of firing from 200 to 250 shots at noon every day was still practiced here, and many of those shots had from 40 to 50 inches of powder in them. How many of the miners stop to consider the length of time it takes to clear the mine of the smoke, fume and sulphur liberated by the combustion of so much powder in a confined place like that of a coal mine? The fact is there is no fan constructed or system of ventilation yet evolved from the brain of man, that will offset the evils produced by the firing of 200 or more shots at the noon hour every day, even with the best possible facilities for ventilating, and indeed it is surprising to me that the miners will submit to a rule which compels them to inhale an atmosphere so runious to them, *their* health and comfort, and which is responsible for the condition in which some of them are found when reaching the top, the remedy is in their own hands and yet will not apply it. The Morris Mine No. 10 is undoubtedly the best ventilated mine that was ever operated on the Huntsville track. Coal 45 inches thick and worked on the double entry room and pillar plan; 235 men and boys employed. It is the largest producing mine ever operated near Huntsville. 60 cents per ton is paid for mining run of mine coal. Product shipped west.

Emanuel Edwards operates a drift mine on his own land close to Huntsville during winter months to supply home trade.

Hunt Bros. operate a mine at Huntsville. It is entered by a drift and ventilated by a furnace. The mine was opened out to supply home consumption, but considerable of the product is hauled to the railroad, loaded on cars and shipped over the Wabash Railroad. Coal 4 feet thick and worked on the pillar and room plan. Seven men employed in winter and paid 75 cents per ton for mining.

J. J. Lewis is operating a mine at Huntsville. It has a drift opening and ventilation is produced by a furnace. The product of this mine is largely consumed in the immediate neighborhood, but some of it is hauled and shipped over the Wabash Railroad. Coal 4 feet thick and worked on the room and pillar plan. Five men employed in winter, receiving 75 cents per ton for mining.

W. E. Mitchell. Mine located at Huntsville. It is entered by a drift and ventilated by a furnace. This is another local mine, situated three-fourths of a mile from the railroad and could be made a productive one if closer or had better shipping facilities, but having such a long distance to haul its output, it is largely confined to local demand. Coal 4 feet thick and worked on the room and pillar plan. It is practically operated and the largest producer of the local mines around Huntsville. Ten men employed in winter and five in summer. Mining is paid for at the rate of 75 cents per ton for clean coal.

J. F. Robinson operates a mine in the same locality, on the same coal seam and method as the above-named mines. The coal is taken away in wagons and consumed at Huntsville and vicinity. There are other small mines operated in various parts of the county during winter months to supply home trade.

Kimberly Post Office.

Murlin Coal Company, W. E. Murlin, president; John Sneed, superintendent. This company owns and operated four mines at Kimberly during the past year, and they are great factors in the coal production of this county. All the mines are working on the same seam of coal.

and the same method of mining is practiced at each mine, and all have shipping connection with the Wabash Railroad.

Mines Nos. 4 and 5 are located half a mile north of the railroad, and the coal is hauled up to the track by machinery over a tramway built on trestle, lands it on top of a large building constructed along side of the railroad and the coal is dumped into a screen which is connected by a revolving screen which cleans and separates the slacks and prepares it for market. Both mines have drift openings and ventilation is secured by the aid of furnaces. Drift No. 4 is located on the west side and is called the Diamond. I inspected the mine on the 6th of September, 1900, and found the ventilation satisfactory at this date. I made another inspection on the 25th of February and found a deficiency in the air all over the mine; in fact, there was no air in the mine. I was informed that the mine had changed owners since my former visit, and on investigating the cause of the deficiency, discovered that the former operators, during the last few months they operated the mine, were driving their air courses as wide as rooms to avoid paying yardage. These airways had caved shutting off the passage of the air and entailing the trouble and expense of reopening them on the present operators.

I condemn such practice as strong as words can do so, as it shows the smallness of the caliber of any mine operator that woud practice such false economy and crude methods in order to save a few cents and at same time punish his employes. Preparation was made at this date to make connection with another entry and open out another air course, which was completed in five days after date of visit. I made another inspection on the 18th of July and found the ventilation better, but not altogether satisfactory, and instructions were given to clean and enlarge an air course. I was in the mine during the noon hour, at which time from 25 to 30 shots was fired, filling the mine with smoke which the miners had to inhale for fully an hour or more before it cleared away. This is one of the most injurious rules that can be practiced in a mine, in so far as the health and comfort of the employes are concerned, and yet can be so easily done away with. When a place is 30 or 40 feet ahead of a cross cut, and a shot is fired at the noon hour, the miner looses over an hour waiting for the smoke to clear and the place to cool off, then has to go back and inhale the sulphur and fume from the combustion of the powder. I made another inspection on the 28th of October and the ventilation still found deficient as on former visit; in fact, the mine was so badly butchered up before the present operators took charge that it is almost impossible to remedy the evils existing; but the present management is doing all it can to comply with the law, the mine being nearly worked out, they cannot afford to spend much money on it. Coal from 3½ to 4 feet in thickness and worked on the room and pillar plan. Sixty cents per ton is paid for mining unscreened coal. Forty men employed.

Mine No. 5 is opened out on the east side. It was inspected on same dates as the Diamond mine, and the ventilation was found very much vitiated by black damp coming out of an abandoned slope on the north side of the entry. Instructions were given the company to build air tight stoppings to shut it off. February 26, I made another inspection and discovered that a new air shaft had been sunk on the 2nd south entry, a new furnace built, and the ventilation satisfactory at this visit. I made another inspection on the 18th of July and found everything in good condition. Another inspection was made on the 28th of October.

Mine No. 7. Mine located at Kimberly. Shaft 96 feet deep and operated by machinery for hoisting. Ventilation is furnished by a 10-foot fan with very good results. I made an inspection of the mine on the 5th of September, 1900, and found the ventilation satisfactory. February 25, 1901, I visited the mine again and found it in a very fair condition with the ventilation up to the requirements of the law. Communication had been made on the north side of the mine with the Diamond mine on the north of the railroad, and the air was coming in that way to ventilate that side with very good results. I visited the mine on the 18th of July, 1901, and found that it had been temporarily closed down. On my next tour of inspection of the mines of this county I discovered that the track and pit cars had been taken out and the mine abandoned.

Mine No. 9. Mine located one mile west of Kimberly. This is also a shaft and is equipped with machinery for hoisting. Ventilation is furnished by a 12-foot fan in a satisfactory manner. I made four inspections of this mine since the last report was issued, namely, September 5th, 1900, February 25, 1901, July 18th, 1901, and on the 28th of October, 1901. Ventilation as well as the general condition of the mine was found satisfactory at each date. I discovered at date of last inspection that another air shaft had been sunk and an underground connection made and shaft used as an outlet. Coal about 4 feet thick and worked on the double entry room and pillar plan. About 40 men and boys employed.

This company has opened out two new mines on the H. Smith land, about one mile east of Huntsville, having shipping connection with the main line of the Wabash Railroad. Both have slope openings and are reached by an inclined tramway 1,200 feet long, the coal being hauled by means of a gravity rope. The mine is equipped with a pair of Ellison engines with twin cylinders 12 by 18 inches, geared three to one, connected to a 5-foot drum with Ellison patent friction clutch. The coal will be handled on the head house or landing by gravity tracks for both loads and empties, and weighed on a hopper scale, thus avoiding the weighing of pit cars each time, and insuring accurate and just weights to the miners. The screen will grade the coal into three different grades or sizes, and lump, mine run, nut and steam coal will be loaded at the mine. The loading switch will hold 40 cars, and the management intends to bring the capacity of these mines up to 1,200 tons a day inside of a year.

Work was commenced on these mines on the 1st of October, 1901, and at the end of December both slopes were opened, cross entries turned, air shafts sunk and underground connections made with same, 1,200 feet of trestle work erected, head house built, a hopper pocket and a hopper scale constructed, the machinery set and a commodious building for machinery and boiler built, and the mine ready to ship coal on the 1st of January, 1902, but shipment was delayed on account of the railroad company failing to complete the switch, owing to winter weather. The mines will be operated on the double entry room and pillar plan, and ventilation will be furnished by the aid of furnaces for a while, but when further developed we think a fan will be substituted for the furnace. We visited the mine in December, 1901, but no system of ventilation had been adopted at this date. We noticed that both slopes had been very practically opened and well secured with timber. The coal will average 4 feet or more in thickness; it is overlaid with excellent roof and at this stage promises to be an excellent mine. The company owns a large tract of coal land in that locality and its mines will be great factors in the coal production of Randolph county.

Moberly Post Office.

Enterprise Coal Co., John Cronan, operator and manager. Mine located 3 miles northwest of Moberly. It is entered by a drift and ventilated by a furnace. The coal will run from 3 feet 8 inches to 4 feet in thickness and of fine quality for both steam and domestic purposes. It is underlaid by a fire clay mining, and overlaid by a variety of slate and sandstone which makes good roof, because easily secured. The product is taken in wagons to Moberly and surroundings where it is consumed, consequently the capacity of the mine is limited to the local demand. Employment is given to 6 men, and 75 cents per ton is paid for mining clean coal.

Cooper & Stackhouse Coal Co. Mine located one mile west of Moberly and has shipping connection with the Wabash Railroad. Shaft 125 feet deep, hoisting by steam power. The ventilation is secured by the aid of a furnace and giving very good results. I inspected the mine on the 6th of September, 1900, and found the air considerably better than on former inspections, but it could be bettered by cleaning the air course where air was traveling to furnace. On the 21st of February, 1901, I made another careful inspection and found the ventilation satisfactory, but the mine otherwise was in bad condition, and the company was instructed to timber all the entries and make them secure and put safety catches on cages. On the 18th of July, 1901, I made another visit and found the mine in very good condition. I discovered that the entries had been timbered and the ventilation good, the safety catches were on the ground ready to be put on cages. I learned that they were put on in two days after this visit. Another thorough inspection was made on the 29th of October, 1901, and mine found in a satisfactory condition. We noticed on this visit that entries were driven on the west side of the north entry to make a shorter haul for the coal as well as to shorten the route of the air current. This improvement, as soon as it is completed, will greatly improve the mine. Coal, four feet thick and worked on the room and pillar plan; about 30 men employed. A large portion of the product is taken away in wagons and consumed at Moberly and vicinity, while the balance is shipped over the Wabash Railroad.

Harry Ward is operating a mine two miles northwest of Moberly, shaft, 89 feet deep; hoisting by a horse. Ventilation is furnished by a furnace. Mine only operated during fall and winter; product consumed in surrounding country.

RALLS COUNTY.

Production, 25,238 tons.

Ralls shows considerable increase in her output of coal during the past year as compared with the previous one, and we expect to find still larger increase, as her coal field is being constantly developed, and new mines opened out.

Perry Postoffice.

Ralls County Coal Co. Mine located one and one-half miles northeast of Perry and connected with the Hannibal & St. Louis Railroad. Shaft, 45 feet deep; using horse power for hoisting. Ventilation is secured by the aid of a furnace with satisfactory results I made a careful inspection of the mine on the 5th of October, 1900, and found it in good condition. I discovered that a new air course had been made from the furnace to the south entry off of the first east, which was used for the return of the air and had greatly increased the volume of air all over the mine. I made another inspection on the 13th of June, 1901, and found the mine in a very satisfactory condition. The air enters the mine at the hoisting shaft and travels over the north entry to its terminus; thence to the east returning to the up-cast along the face of the workings, ventilating the mine in a practical way and keeping it in good sanitary condition. On the 19th of November, 1901, I visited the mine again and found it in excellent condition with everything very satisfactory, the air good, roadways dry, high, safe and clean and in good working order. Coal, 26 inches thick and worked on the longwall plan paying 91 cents per ton for mining; from 30 to 35 men employed; the product is nearly all consumed by the Hannibal & St. Louis Railroad on the engines. Fred King, foreman.

Clark Coal Co. Mine located 1¾ miles northwest of Perry and has shipping connection with the Hannibal & St. Louis Railroad. Shaft, 60 feet deep; operated by horse power. The ventilation is furnished by a furnace with satisfactory results. I inspected the mine on the 5th of October, 1900, and found it in excellent condition with the ventilation very good all around. On the 13th of June, 1901, I visited the mine again and made another inspection and found that a fault had been encountered on the south and west entries which caused a derangement in the ventilative current of air. The mine being operated on the longwall plan could not be driven through the fault on that plan, and narrow entries were driven through it into good coal. An air-course was in course of construction at this date, which when completed it was expected would bring the ventilation up to the requirements of the mine. Another inspection was made on the 19th of November, 1901, and discovered that the whole face had been driven through the fault and the ventilation was passing around the entire face of the work making the air good in every part of the mine. Same seam mined here as at the other mines, with other condition the same. 15 men employed.

Perry Coal Co. Mine located two miles northeast of Perry and has shipping connection with the Hannibal & St. Louis Railroad. Shaft, 63 feet deep; hoisting by horse power. This is a new mine; shaft sunk and opened out during the past year, and at date of first inspection June 13, 1901, had connections made with the air-course and a good current of air found circulating around. The ventilation was secured by the aid of a furnace which was built at the bottom of the shaft exhausting through an air chamber partitioned off at one end of hoisting shaft, instructions were given the company to sink an escapement shaft. I returned to the mine and made another inspection on the 19th of November, 1901, and found the ventilation good and the conditon of the mine satisfactory; but the escapement shaft had not been sunk as yet. The company was again instructed to sink an escape at once, which it promised to do. Coal, 26 inches thick and worked on the longwall plan; about 15 men employed: the product is consumed at local towns along the railroad, but a large portion is sold at Hannibal, it being a fine domestic coal.

Ralls County Coal Co. Mine No. 2. This company opened out another mine the latter part of last year about one mile east of mine No. 1, and has shipping connection with the same railroad. Shaft, 45 feet deep; hoisting by horse power. Ventilation is furnished by the aid of a furnace which is located at the bottom of the hoisting shaft, exhausting through an air chamber partitioned off along side of same, but an escape shaft will be sunk at once and the furnace removed. The same seam is mined here as that at the other mines, and the discription of one mine is suitable to them all. All the mines are remarkable dry, taking into consideration the shallowness of the covering. The coal is of excellent quality for both steam and domestic purposes, and always finds a ready market where once used. The seam is overlaid by a slate roof which is easily secured by timber and the mines can be economically operated.

I Burger is operating a mine near Perry in the winter months to supply home demand.

R. Wells and John Akerson operate drift mines in the neighborhood of Perry in fall and winter to supply home trade.

RAY COUNTY.

(Production, 264,900 tons.)

Ray county, like all the other large coal producing counties of the State, shows an increase in her output of coal the past year. The output of coal amounts to 264,900 tons, showing an increase of 21,308 tons as compared with previous report. The number of men employed in and around the mines averaged 1,104 in winter months, and 669 during the summer season. Of the 25 mines operated in this county all are worked on the longwall plan, and are mining the same coal seams throughout. The principal mines are located at Camden, Fleming and Richmond, while smaller mines are operated in other section to supply local consumption. Following is a description of each mine, together with a statement as to their location and condition as *found* at dates of inspection.

Fleming Postoffice.

Murlin Coal Co. W. E. Murlin, President, and Harry Wyett, Foreman. Mine located at Fleming and has shipping connection with the Wabash Railroad. Shaft, 70 feet deep; equipped with good machinery for hoisting. The mine is ventilated by a 12 foot fan and giving excellent results. The ventilative current comes down the main shaft traveling over the north entry as far as first east, where it is turned and conducted over the first north off of the east until it reaches its terminus. Here it is divided to the east and west sides traveling along the face of the workings furnishing plenty of fresh and healthy air to every part of the mine where men are at work; thence, passing abandoned workings on its return to the fan shaft after serving the men. This method of ventilating mines is practical and the only method that should be practiced in any mine as in this manner the miner gets the first air direct from the down cast, and we highly commend this company for its untiring efforts to operate its mines in a safe and healthy condition. I made the first inspection of this mine on the 15th of November, 1900, and found it in excellent condition. Test of the air was taken on the intake at main north entry and 24,320 cubic feet was found passing in one minute with 92 men at work. This volume of air is conducted around in two currents in a very satisfactory manner as it gives every man plenty of fresh air to breathe. Machinery, ropes, cages and safety catches were thoroughly examined at this visit and found in good working condition. February 28, 1901, I made another careful inspection and found the ventilation the same as on my last inspection double the amount required by law and the general condition of the mine was first-class. On examining the safety catches at date of this visit I discovered that the spiral spring had become twisted somewhat by the rough usage of the cage and this prevented the cams or sectors from taking hold or biting into the guides if the rope should brake. The foreman was notified to reset the catches and put them in good working order, and in a few days this office was notified that the defect was immediately remedied. I also examined the escapement shaft and discovered parts of the stairway rotted and considered unsafe. It was condemned and we recommended a new stairway built as soon as possible. On the 8th of April, 1901, the following letter was received at this office.

Fleming, Mo., April 8, 1901.

Hon. Charles Evans, Inspector of Coal Mines, Jefferson City, Mo.:

Dear Sir—I beg to advise you that in accordance with your recommendation upon your last inspection of our Mine No. 30 at this place, we have erected a new ladder in the escapement shaft at this mine.

Yours truly,
MURLIN COAL CO.,
H. L. McPherson, Cshr.

On the 13th of September, 1901, I made another thorough inspection of this mine, and found it in excellent condition. The fan at this date was making 85 revolutions per minute and was passing 28,155 cubic feet of air over the main in-take in same time. This volume of air was conducted around the works in two currents giving plenty of fresh air to every man therein. I discovered on this visit that a new air-course had been made to conduct the return air from the east side in a more direct way to the up-cast, and in this way the ventilative current was increased on this side. The company has made great improvement at the mine during the last six months of the past year, by equipping it with electricity to do the undermining and hauling the coal from the face to the bottom of shaft, and we can now safely say that the Fleming plant is a model of neatness and completeness. The equipment furnished by the company at this mine during the past six months consist of one new Eric high speed engine, 16x24 inches cylinders, 1 new Morgan-Gardner generator, 250 volts, 100 K. W.; one new Rohan boiler 20 feet long by 72 inches in diameter, carrying 125 pounds; one new Gardner & Morgan electric haulage motor, weighing five tons and hauls about 50 boxes per trip; six new Goodman electric longwall mining machines was also put into the mine. Each machine cuts about 400 linear feet in the clay to a depth of three and one-half feet in eight hours. The entire mine is being lined by copper wire calling for about five miles of same, and the entire entries are lighted by electricity. The power used for the mining machines, motor and lights are generated by one dynamo, and one boiler furnishes the steam for the engine that runs the electric plant, which is set on a substantial rock foundation and enclosed by a commodious and roomy building 40 feet wide by 100 feet long. All the old iron rails through the entire mine have been removed and replaced by 16-pound steel rails, which has made the running of cars and motor so smooth as any of our trunk railways. The motor is traveling at a speed of about 10 miles an hour. All the pit cars had to be made new and remodeled, and 50 new sets of self-oiling wheels have been added to those already used. In addition to the improvement already named, two new cages, two new seven-eighths-inch plough steel hoisting ropes, and one Snow pump, *two and one-half-inch* suction, with two-inch discharge, have also been added to the equipment of the mine, which makes it the finest and best equipped mine in the State. Machine runners get $2.25 per day, and loaders, after the machines, get 60 cents per ton for loading. The electric haulage is a great improvement over mule power, and largely increases the output of the mine. The capacity of the mine had been from 200 to 250 tons per day, but with the machinery, as it is now equipped, an output of 500 tons is expected by the management as soon as the employes get familiar with the machines and the haulage. This will be an innovation in coal mining in Ray county, though the success in mining and hauling coal by electricity has been fully demonstrated at other places. The writer was informed by Mr. Murlin, the president of this company, that his main purpose in putting in the electric plant was to increase the capacity of the mine which had failed during the past year to meet the demands. This mine is already fully 4,000 feet from the shaft to the face of the work, and has an unlimited territory to work on, and the coal could not be hauled out profitably by mules. The improvements added to the mine during the past year, which must have cost the company from $30,000 to $40,000, has made a new mine of it, and is now good for 20 more years of a large output.

Hardin Postoffice.

The coal so extensively worked at Camden, Fleming and Richmond, extends to Hardin and Norbourne, and a large number of small mines are operated here during the winter months. The coal crops out at the foot of the bluffs, the mines entered by drifts and ventilated by small furnaces. It is of the same thickness, worked on the same method and the same price paid for mining as that of all other mines in the county. Name of parties operating mines in this locality, output of mines and all other information concerning same will be found in the statistical table of this county.

Knoxville Postoffice.

The Grimes Mine is operated by Hugh Blair. Mine located at Knoxville, and operated to supply home consumption. Shaft 190 feet deep. Hoisting by horse power. Ventilation is produced by a small furnace. Coal 24 inches thick, and worked on the longwall plan. Mine only worked during the cold season, and the product consumed at Knoxville and locality.

Ovid Postoffice.

The Climax Mine is operated by W. H. Blunt. This mine is located at Georgeville, and was formerly known as the Sater Mine. Shaft

160 feet deep. Hoisting by a horse. Mine only operated in fall and winter, and the product consumed in the neighborhood.

Richmond Postoffice.

Richmond is the great coal center of Northwest Missouri. It is surrounded by coal mines, and is one of the best mining towns in the State. It is located near the center of the county, and has several mines within the corporate limits of the city, and is almost entirely supported by the mining operations carried on within its surroundings. There are 800 men and boys employed in and about the mines within a radius of three miles of Richmond, and while millions of tons of coal have been taken out, yet mining is in its infancy here, and its production is yearly increasing.

Crispin & Ward Mine, located at Richmond. Shaft 87 feet deep, and hoisting by a horse. Ventilation is furnished by a furnace. Coal 24 inches thick, and worked on the longwall plan. Mine only operated during the fall and winter, and the product consumed at Richmond.

The Daugherty Mine is operated by W. O. Ward. It is located about one and one-half miles southeast of Richmond. Shaft 60 feet deep, and hoisting by horse power. Ventilation is produced by a furnace. Coal 24 inches thick, and worked on the longwall plan. Coal taken away in wagons, and consumed at Richmond and vicinity.

Andrew Blair operates a mine near Richmond during the fall and winter to supply home trade. The shaft is 50 feet deep, using horse power for hoisting. Coal 24 inches thick, worked on the longwall plan, employing three men, paying $1.00 per ton for mining and wheeling.

Robt. Hayson. Mine located at Richmond one block from court house. Shaft 80 feet deep, and operated by horse power. Ventilation is produced by a furnace. Coal 24 inches thick, and worked on the longwall plan. Seven men employed in winter and four in summer. One dollar per ton is paid for mining. Coal consumed at Richmond.

Fowler Coal Co. Mine located two miles south of Richmond and has shipping connection with the St. Joe branch of the Santa Fe Railroad. Shaft 40 feet deep, and hoisting by horse power. Ventilation is secured by the aid of a furnace with good results. This is a new mine. It was sunk during the spring of 1900, but being located one mile from the railroad the output was confined to wagon trade until the spring of 1901, when a switch was put in from the main track to the mine, and it is now classed as a commercial mine. I visited it on the 2nd of March, but not finding any one at work, no inspection was made. I discovered men at work at this date grading for the switch, which was nearly completed. I made a careful inspection of the mine on the 10th of September, 1901, and found it considerably developed and practically opened out. The rock had been taken down on the main entry, and mules are soon to be put to work to haul out the coal in place of men. Coal 24 inches thick, and worked on the longwall system. Twenty-five men employed. One dollar per ton is paid for mining.

The Sevier Mine is operated by Chas. Ottman. Mine located two miles east of Richmond. Mine entered by a slope and ventilated by a furnace. Thickness of coal, mode of working and price paid for mining are the same as that at other mines in this locality. Coal consumed at Richmond and vicinity.

Hubbell Coal Co., H. Brown foreman. Mine located close to the city limits, and connected with the St. Joseph branch of the Santa Fe Railroad. Shaft 110 feet deep, and operated by horse power. Ventilation is furnished by a furnace, which is giving good results. I made three inspections of this mine since last report was issued and found everything satisfactory.

I examined the communication between this and the Pickering Mine on last visit made, and found that the bottom had heaved and the space considerably contracted, but it was passable for a man to go through easily in case anything happened to hoisting shaft. Coal 24 inches thick, and worked on the longwall plan, with the moveable face track in use. Employment is given to about 40 men in fall and winter, and pay $1.00 per ton for mining.

Pickering Coal Co. Mine located near Richmond, and has shipping connection with the St. Joseph branch of the Santa Fe R. R. Shaft 107 feet deep. Equipped with machinery for hoisting. Ventilation is produced by a furnace with satisfactory results. I inspected the mine on the 16th of November, 1900, and found it in good condition with all the safety appliances in good order. I made another inspection on the 27th of February, 1901, and found everything all right. On the 11th of September, 1901, I visited the mine again and found it in good condition with the ventilation and the safety appliances in good order. Thickness of coal, mode of working, and price paid for mining is the same at this mine as that of all others in this locality. Thirty-five men employed. The product is consumed at St. Joseph.

Mercantile Coal Co., Frank Atwil, superintendent; Robt. Blair, foreman. This company is now operating two mines near Richmond, both of which have shipping connection with the St. Joseph branch of the Santa Fe Railroad. Both mines are working the same vein of coal, the same method of mining is practiced at each mine, and both are under the same supervision.

Mine No. 7 is located at Richmond. Shaft 110 feet deep. Equipped with machinery for hoisting, and ventilated by a furnace. I made a careful examination on the 16th of November, 1900, and found the ventilation very fair, considering the long route the air has to travel. The mine having been extensively worked, was also badly neglected in former years. When the demand for coal slackened up in the spring the mine was closed and kept closed until the fall trade started up again. Not a dollar of the earnings of the mine was spent in repairs on it, and everything was left to go to wreck. The ventilative current has to travel over very small airways along the face of old and abandoned workings, full of bends and angles, over stagnant water, and where the settling of the roof is constantly in action, making the area so small that it is almost impossible for much air to screen through. The mine has also outgrown the capacity of the furnace proper, as it has to be fired up to its extreme limits at all times to keep the ventilation to the limit of the law. The air passes down the hoisting shaft and travels the north entry to its terminus where it divides to the right and left hand sides and returning to the furnace. The fire was well attended to, and the doors carefully looked after. February 27th, 1901, I visited the mine and found everyithing satisfactory. I made another inspection on the 11th of September, 1901, and discovered on this visit that the work on the east side had been abandoned and all the men were confined to the straight and left north. In the very near future this mine will be abandoned. We found the ventilation fully satisfactory, and about 60 men employed. The product is mostly consumed at St. Joseph.

Mine No. 17 is located about a mile north of Mine No. 7 and about half a mile from the city limits. Shaft 190 feet deep, and equipped with first-class machinery for hoisting. This is a new mine. Shaft sunk and mine equipped during the spring and summer of the past year, and at date of my visit, September 12, 1901, it had an output of a 100 tons per day and increasing with each succeeding day's work. The engines were built by the Ottumwa Iron Works Co. of Ottumwa, Iowa. The cylinders are 10x14, connected to a 5-foot drum. The machinery has been set on nature's own masonry—the solid rock leveled up and a wooden frame placed thereon for the engines to rest on, and all enclosed by a substantial and commodious engine house. Steam is supplied by a two-flue boiler 24 feet long and 48 inches in diameter. An escapement shaft was sunk and an underground connection between the two shafts had been made at date of my visit. The escape shaft is partitioned off into two compartments, one of which answers for a passageway for the air, while the other has a ladder erected in it for the escape of the miners in the event of an accident in the hoisting shaft. A 10-foot fan is set on top of the escape shaft, and constructed with doors so that it can be made to exhaust or force air in or out of the mine as the requirements may be without stopping the fan. The head gear and top buildings are well constructed, and afford every convenience and facility for rapidity and economy in handling coal. The cages are new, strongly built and supplied with the most modern safety catches. New hoisting ropes have been added, all of which makes it one of the most complete plants in the State. The underground work has been opened out very practically, and the plan contemplates that cross entries are to be turned at right angles from main entries, and that an over-cast erected in the near future which will furnish two separate and distinct currents of air for each side of the shaft and make in all four currents, which plan will doubtless prove perfect in ventilating the mine. Under the supervision of a practical manager, we anticipate no deficiency in the ventilation during the life of the mine. Thickness of coal, mode of working and price paid for mining is the same as that of other mines in the surroundings of Richmond. About 40 men employed at date of visit.

Wilson Coal Co.; Wm. Wilson, manager. Mine located within the city limits and connected with the St. Joseph Branch of the Santa Fe R. R. Shaft, 110 feet deep; hoisting by steam power. Ventilation is produced by a furnace which is inadequate to properly ventilate the mine. The mine has been in operation for a great number of years, extensively worked and badly managed and neglected. The bottom has heaved and the roof has settled along the face of the workings in the return airways to that extent that it has almost closed them up, and as the mine is nearly worked out it is now too far gone to make any improvement in the airways. Ventilation will be kept up the best it can until finished. I made three inspections of the mine at same dates as at the other mines in same locality. Coal, 22 inches thick and worked on the longwall plan. About 35 men employed in winter, receiving one dollar a ton for mining. Product consumed at St. Joseph.

Mine No. 1 is located near Henry, and has connection with the St. Joseph Branch of the Santa Fe R. R. It is entered by a drift, ventilated by a furnace, and operated by Mr. A. F. Rankin, its owner. I inspected the mine on the 19th of November, 1900 and found the ventilation all right, but the roadways were wet and muddy and the mine in poor condition. I made another inspection on the 2nd of March, but as the mine was not running no test of the air was taken. I discovered a check at this date between the crooked east and north entries and instructions were given to have it cleaned. I made another visit on the 9th of September, and found that a shaft had been sunk at the face of the work which was equipped with a horse power apparatus. This suited the purposes for an escape shaft as well as an air and hoisting shaft, and made the condition of the mine and its safety very satisfactory. A tram road is also built from the new shaft to the railroad track. Mine closed down during summer and was not running at last visit.

Pence & Calnen Coal Co.; J. Calnen, superintendent. Mine located one mile southwest of Richmond and has shipping connection with the St. Joseph Branch of the Santa Fe R. R. by a spur switch extending from the main track. Shaft, 85 feet deep; equipped with machinery for hoisting. I made three inspections of this mine during the past year, and found it in good condition at each inspection. I made the first inspection on the 17th of November, 1900. I discovered at this visit that a fan had been erected to take the place of the furnace which greatly increased the ventilative volume of air. The mine at this date was ventilated by only one current of air, and as this current had to travel all around the mine and furnish air to 90 men, I discovered it was very much vitiated with impurities before it reached the last of the miners, and we recommended that the ventilative volume of air be divided into two currents. On the 1st of March we visited the mine again and made another inspection and found the mine in excellent condition with the ventilation fully satisfactory as only about 40 men were working therein at this date. I discovered that preparation was being made to divide the air into two currents. I made another inspection on the 9th of September and found the quantity of air passing equal to the requirements of the law, but was still circulating around the mine in one current and was very impure, and we notified the management that the air must be divided within 20 days from date into two currents or the mine would be closed. We also requested the employes to notify this department if the company failed to comply with our instructions, and later we were informed that it complied. Coal, 22 inches thick and worked on the longwall plan. Coal shipped to St. Joseph and points north.

Mine No. 3. This mine is located at Lower Camden, and has shipping connection with the Santa Fe R. R. by a spur switch extending from main track to the mine. Shaft, 40 feet deep; equipped by machinery for hoisting, and ventilated by a furnace. This mine was formerly operated by Lockwood & Lusk, but is now leased and operated by the Pence Bros. of Richmond. I made an inspection of it on the 15th of November, 1900, and discovered that the west part of the mine had been abandoned and some works opened out on the east side. I found the ventilation up to the demand of the law, but the miners were burning a very inferior grade of oil that was filling up the place with fume and smoke and made the mine so smoky that lights could hardly be seen, and all this discomfort in order to save 25 cents on the gallon. I inspected the mine again on the 28th of February and found the ventilation very good, but the mine otherwise in bad condition on account of too much water and mud. Another inspection was made on the 13th of September and the mine was found at this date in excellent condition with the ventilation fully satisfactory. I discovered that great improvement had been made since last visit, by draining the water shooting down the rock, and recurbing air shaft, thus putting the mine in good shape. All conditions in regard to mining is the same here as that of other mines in Ray county.

Camden & Richmond Coal Co.; John Gibson, superintendent and manager; R. Gibson, assistant. This company owns and is operating seven mines in this county, from which a large amount of coal is produced every year, and employment furnished to a large number of men. The mines are all worked on the longwall system, well ventilated and fairly drained, with good, high roadways, and the general condition of each mine very good. The thickness of the coal at the Camden mines is about 18 inches. It is overlaid by a draw slate 10 inches thick, which comes down with the coal and is used to build walls along the roadways to secure the roof, as no timber is used at the face of the work in these mines. The coal in the surroundings of Richmond averages about 23 inches in thickness, and is also overlaid with good strong roof; the moveable face track is used in all the mines. Following is a statement as to their condition as found at dates of inspection. Mines Nos. 1 and 2 are located one mile west of Camden and are connected with the Wabash and Santa Fe Railways. Both mines have shafts of same depth and are equipped with good machinery for hoisting, draining and ventilating. Both mines are ventilated by the one fan which is located at Mine No. 2 and furnishing plenty of air to the mines. I made three inspections of these mines since last report was issued, and found the ventilation satisfactory and the mines otherwise in good condition at each inspection. My first inspection was made on the 15th of November, 1900, and the mine was found in good condition. I made another inspection on the 28th of February, 1901, and found everything satisfactory, I discovered on this visit that the west entry at Mine No. 2 had been re-opened after having been closed down about eight years. The air in this entry was somewhat retarded in its passage caused by the clay bottom heaving, but there was plenty of air passing. I made another inspection on the 13th of September and found both mines in a very satisfactory condition with the ventilation extra good. The safety catch on one of the cages at Mine No. 1 was found broken and instructions were given to have it fixed and made safe at once. Coal, 18 inches thick and worked on the longwall plan, using the moveable face track. One dollar per ton is paid for mining, from 75 to 100 men employed at the two mines. Product shipped to Kansas City, but the Wabash Railroad Company is using a large amount on their engines, ten chutes having been erected at Mine No. 1 for that purpose.

Mines Nos. 4 and 5 are located one mile south of Richmond and connected with the St. Joseph Branch of the Santa Fe Railroad. Mine No. 4 has a shaft 70 feet deep, and is equipped with very fair machinery for hoisting. Ventilation is furnished by a 12-foot fan with satisfactory results. This mine is connected by underground roadways with Mine No. 5 thus furnishing an avenue of escape to the miners in case of an accident to the hoisting shaft. I inspected the mine on the 19th of November, 1900, and found it in good condition with the ventilation double the amount required by law. I discovered that considerable improvement had been made in grading and draining the roadways. I visited the mine again on the 1st of March and found everything satisfactory. I made another inspection on the 9th of September and found the ventilation and the condition of the mine fully satisfactory. The product is shipped to St. Joseph, but a large portion of it is consumed by the railroad company on its engines. Chutes have been erected at the mine to coal trains. This mine has been extensively worked; has a very long haul, and makes a large amount of water on the south end. About 75 men employed in winter. L. Wilkerson, foreman.

Mine No. 5 is also a steam plant, and adjoins No. 4 on the north. The shaft is 75 feet deep. The ventilation is furnished by the same fan as that ventilating mine No. 4 and the same description of underground work applies here as that given of No. 4. Good roadways are maintained between the two shafts for escapement from either one in case of accident. I inspected both mines at same dates and found the requirements of the law complied with and both mines in good condition. At date of my last visit to this mine I ound it closed down for repairs. New foundation sills were put in under the pit head gear, the shaft was retimbered from top to bottom with 3-inch white pine, and the roadways remodeled through the entire mine. The company having purchased more coal land, gives new life to the mine. Thos. Shea, foreman.

Mine No. 9 is located one-half mile west of Richmond and connected with the St. Joseph Branch of the Santa Fe R. R. Shaft, 100 feet deep and the only mine operated by this company where hoisting is done by horse power. Ventilation is produced by a furnace with good results. I made three inspections of this mine during the past 18 months and found it in good condition at each inspection. The same seam of coal is worked here as that at all other mines in this locality. About 35 men employed. The product is taken to St. Joseph.

Mine No. 12 is located one and one-half miles northwest of Richmond and connected with the St. Joseph Branch. Shaft, 110 feet deep, and equipped with good machinery for hoisting. This mine was equipped for a great producer, but unfortunately for miner and operator, the coal proved low and faulty, and very little work is being done in it.

Mine No. 14 is located close to the city limits and has connection with the St. Joseph Branch of the Santa Fe R. R. Shaft, 90 feet deep; equipped with good machinery for hoisting. Ventilation was produced at dates of first and second inspections by a furnace, but the company was contemplating putting in a fan in the near future. This is a new mine. Shaft sunk and mine opened out during the past year. The company has equipped it with good machinery. The pit head and tipple house is well-constructed for convenience and economy. The machinery is set on solid rock foundation enclosed by a good engine and a boiler house. I inspected the mine on the 17th of November, 1900, and found it in excellent condition. The ventilative volume of air at this date was coming down the main shaft and was conducted to the first north entry and split to the east and west, and giving satisfaction. A communication had been made with the escapement shaft making everything safe about the mine. On the 1st of March I made another inspection and found the mine and all the safety appliances in excellent condition. I made another inspection on the 11th of September and found the condition of the mine and the ventilation very satisfactory. I discovered at this visit that the entries had been brushed and made wide and the mine greatly developed since last inspection. It is located in close proximity to old Mine No. 6, and has an underground connection with the latter which is used as an escapement way. The mine is dry and clean and will soon be a good producer. Thickness of coal and mode of working and price paid for mining is the same here as at other mines in this county. Coal shipped to St. Joseph and points north. James Blair, foreman.

Swanwick Postoffice.

Fowler & Mackin Coal Co. Mine located at Swanwick and has shipping connection with the St. Joseph Branch of the Santa Fe R. R. Shaft, 110 feet deep; equipped with horse power for hoisting, and ventilated by a furnace. This mine was formerly operated by the Williams Coal Co., but it sold the mine to the present operators during the past year. The mine is working the same seam of coal and on the same method as all the other mines in Ray county, and the same price is paid for mining. I made three inspections of it during the past year and found the ventilation satisfactory at each visit. The escape shaft was retimbered during the past year and the communication between the two shafts is kept open for the passage way of men in case of an accident to hoisting shaft. Coal shipped and consumed at St. Joseph. Thirty men employed.

ST. CLAIR COUNTY.

While the greatest portion of St. Clair county is underlaid by the coal bearing rock formation, yet very little mining is carried on in the county. The coal around Appleton, is about 18 inches in thickness and is obtained by stripping, while around Iuka Springs, Tiffin, Dottie and Johnson City the coal will run from three feet to three and one-half in thickness, and at Osceola, Lowry City and Taberville the coal is about 26 inches and a large portion mined by stripping. There are mines in the surroundings of Lowry City that could be made productive if close enough to a railroad so that the product could be shipped. The output is confined to local trade. Names of operators, output and all other information concerning the mines of this county will be found in the statistical table in this report.

Saline and Schuyler counties are small producers of coal, but more especially Saline county, which reports one or two mines each year, yet the county is nearly all underlaid by the coal formation. Schuyler county has a 4-foot seam of coal underlying a large portion of her territory which will be fully developed in the near future. This seam is now worked at the head of the Chariton River near the Iowa line, but the mine is located two miles from a railrorad.

VERNON COUNTY.

During the year Vernon county produced 164,972 tons of coal, which was sold at the mines for a total valuation of $170,246, and is the product of 15 mines, employing 302 men and boys, in and around the mines. The most productive mines at present operated are located at Panama, in the northern part of the county, but new coal discoveries are made all the time, and other mines will soon be opened further east and south. The coal belt embracing Bates county extends throughout Vernon in a southeasterly direction, where the prospector will soon be at work developing the coal field of that section of Vernon. Following will be found a detailed description of the more important mines, their location and condition as found at dates of inspection:

Arthur Postoffice.

Arthur Coal Co., Frank Williams, superintendent. Mine located one and one-half miles north of Arthur, and has connection with the Missouri Pacific Railroad. The mine is located nearly a mile east of the railroad, and the coal is hauled by mules over a tramway, dumped into cars at the switch, and shipped over said railroad to market. Mine is entered by a drift, and ventilated by a furnace. The ventilation was found very much disarranged at each inspection, as no system of conducting the air around the mine is practiced here. The pillars are nearly all taken out between rooms, and cross cuts. Mouths of abandoned rooms are left open for the air to drift where it pleases, with nothing to check it, except canvas doors, and when the air gets deficient an air shaft is sunk to remedy it. The mine is entered from the bottom of a strip pit and surrounded by strip pits, and is now nearly worked out. Found all the men confined to drawing pillars at date of last inspection. I visited the mine on the 14th of October again, and discovered that it had remained idle during the summer months and had just started operation at this date. It was in a deplorable condition, with water and mud everywhere, with only about 15 men at work. The ventilation was found satisfactory. Coal four feet thick, and worked on the room and pillar plan. The product is hauled from the mine over a tram road for a mile, dumped on cars and shipped over the Mo. P. R. R.

Rich Hill Postoffice of Vernon County Operators.

Rush Coal Co., Jas. Brown, superintendent; Thos. Watson, foreman. Mine located five miles southwest of Rich Hill, and has shipping connection with the Mo. P. R. R. by a spur switch extending from the main track to the mine. Shaft 100 feet deep, and equipped with first-class machinery for hoisting. This is a new mine, the shaft having been sunk in the fall of 1900, and coal struck at the above mentioned depth. The pit top and head gear are well constructed for convenience and economy in working. The top landing stands 20 feet above the rail, and from the ground to the sheave-wheels is 40 feet. The engines were built by the Keystone Iron Works at Kansas City, Mo., and are 12x16-inch cylinders, connected to a five-foot drum. Two large boilers are used in generating the steam. The machinery is set on good rock foundations, and enclosed by a good substantial engine and boiler house. The cages are new and strongly built, and supplied with the latest improved safety catches. New hoisting ropes have also been put on. The equipment is new and embraces all of the modern improvements. Ventilation is furnished by a fan with satisfactory effect. I made the first inspection of this mine on the 9th of November, 1900. The fan at this date was set on one end of hoisting shaft exhausting through an air chamber partitioned off main shaft, but as soon as the escapement shaft is sunk the fan will be removed. The ventilative volume of air is conducted around in two currents, furnishing plenty of air to every part of the mine. I inspected the mine again on the 3rd of June, and found it in good condition with plenty of fresh air flowing through it. I discovered at this date that the escapement shaft was sunk and preparation was being made for the under ground connection between the two shafts, and to remove the fan. On the 14th of October I made another inspection, and found conditions very satisfactory. I discovered on this visit that the communication between the two shafts had been made; the fan removed and set on top of escape shaft, and a ladder erected, and everything constructed in full compliance with the mining law having reference to mine management. The ventilative current of air was found almost double the quantity required by the law, and practically conducted around the mine. Coal 42 inches thick, and worked on the double entry room and pillar plan, and the coal extracted by blasting it off the solid. The mine is practically operated, roadways dry, high, and clean. About 75 men and five mules employed.

Panama Postoffice.

Central Coal and Coke Co., David Mackie, general manager; John H. Williams, superintendent. This company is operating two mines in this locality, and both have shipping connection with the Missouri Pacific by switches. Both mines are working the same seam of coal (which varies greatly in thickness), and on the same plan. Both have shaft openings, are operated by machinery, ventilated by fans, and are under the same management.

Mine No. 14 is located one and one-half miles south of Panama. Shaft 114 feet deep, and operated by a good steam plant. Ventilation is furnished by a 15-foot fan, with excellent results. I made three inspections of the mine during the past year, and found it in a satisfactory condition at each visit. The ventilative volume of air is conducted around the mine in four separate currents supplying every part of the mine, with plenty of fresh air. I made the first inspection on the 9th of November, 1900, and was fully satisfied with the result of same. On the 3rd of June, 1901, I made another inspection, and found the ventilation and condition of the mine satisfactory. October the 17th, I returned and made another careful inspection, with satisfactory results.

The coal runs very uneven, rolling and changing so suddenly to the rise or dip, as to seriously interfere with any systematic regulation of the air current, besides that it adds greatly to operating expenses. An incline plane is constructed inside the mine, and the coal is hauled from the dip entries by machinery. The mine generates gas, which is found in the raise entries, but it is carefully looked after and taken care of. Gasmen are employed here to go around and examine every part of the mine every morning and see that it is clear of gas before the men are allowed to enter it. Shot firers are also employed at high wages to fire all shots after the employes have left the mine, showing that the safety and comfort of the employes are carefully looked after by the management. We noticed also at each inspection that the machinery, ropes, cages, safety catches, cage covers and all safety appliances are kept in safe condition at all times. Coal will vary from four to six feet in thickness, worked on the room and pillar plan, and extracted by the use of powder; 135, 110 and 85 men were employed respectively at dates of inspection. Product shipped to Kansas City and points west.

Mine No. 17 is located one mile east of Mine No. 14, and connecting with the same switch as the latter mine for shipping facilities. The shaft is 80 feet deep, and equipped with first-class machinery for hoisting. This mine shaft was sunk in the summer of 1901, and at date of my visit, October 17th, I discovered that coal had been struck, the machinery and boiler set, the pit top and head house erected, about one mile of railroad built, and everything was then ready to commence shipping coal. The equipment for Mine No. 21 was bought by this company, removed, remodeled and set up at this mine. The escapement shaft is located about 300 feet from main shaft, both were sunk at the same time, and an underground connection had been made at date of my visit. A 12-foot fan had been built on top of the escape to furnish the ventilation in the mine, and the fan house and casing is so constructed with doors that the fan can be made to force or exhaust air in the mine as the requirements may be, without stopping it. The escape shaft is partitioned off into two compartments, one for the air proper to travel, while a stairway is built in the other. The mine as equipped, planned and contemplated by the operators will be a good producer, but as there was no system of ventilation adopted at this time, and operation just started, will *write more fully* after it is further developed.

COAL POCKETS.

Isolated deposits of coal are found in a number of counties, but more frequently met with in the counties of Callaway, Cole, Miller, Moniteau. Morgan and Saline. The coal found in the pockets lie in the form of a basin, sometimes with a very even curvature and again the sides have an abrupt pitch. In some instances it is stratified, the layers lying horizontally in the center but curving as the walls are reached. The Stover and Simpson deposits east and northeast of Versailles, Morgan county, have been celebrated for their thickness, shafts having demonstrated the coal to a depth of 80 feet. The Cannel Coal deposit at Hickory Hill, Cole county, has been tested to a depth of 90 feet and is comparatively unknown because of its heretofore great distance from a railroad, the opening of the Colorado railroad will doubtless give it more prominence. Within a short distance of the cannel coal deposit a pocket of bituminous coal has been worked, its thickness and extent have as yet to be discovered. Here as well as in most of the coal deposits, zinc blende occurs and sometimes lead in considerable quantity. In Miller county, near Aurora Springs, The Republic Coal Company has opened up a coal bank, having installed some very good machinery and constructed two miles of railroad to connect it with the Bagnell Branch of the Missouri Pacific Railroad.

The past year has witnessed more activity in the working and development of coal pockets than for many years, due to the new lead and zinc mines opened up and the construction of the Colorado Railroad. This new road will encounter so many coal deposits along its line in the counties named, that a large business must result to the railroad from them; that which may be lost in the continuity of the deposits will be offset by the great number of pockets that will be opened when transportation facilities are furnished.

The presence of lead and zinc in both the cannel and bituminous varieties of coal found in these pockets, together with the scientific association of these minerals by some geologists, emphasizes the importance of a thorough test of some of our large coal pockets. At no place that we have heard of has there been an investigation or development of these deposits that should satisfy our Board of Geology.

TABLE V—Showing the annual product of each

Counties.	Number of tons of coal mined—					
	1890	1891	1892	1893	1894	1895
Adair	14,840	16,110	14,820	20,957	20,744	24,540
Audrain	22.813	19,569	29,792	42,262	43,910	40,918
Barton	65,097	63,626	108,784	61,301	55,767	76,212
Bates	671,373	726,273	659,924	627,514	291,271	252,231
Boone	21,302	23,577	21,038	25,602	19,088	21,090
Caldwell	17,074	22,661	38,333	29,020	22,869	17,876
Callaway	18,355	15,581	16,551	23,961	23,223	16,771
Carroll	....	....	1,380	1,088	920	2,664
Cass	....	....	....	....	....	....
Cedar	....	1,264	4,181	890	730	1.590
Chariton	120	1,170	2,312	1,136	185	1,859
Clay	5,036	8,289	....	7,139	19,371	4,000
Cole	....	2,000	1,548	1,200	2,000	1,120
Coopeer	1,594	2,200	3,666	2,892	2,639	2,492
Dade	1,400	3,402	6,881	6,695	2,327	5,066
Grundy	23,593	28,983	28,670	35,770	35,000	37,200
Henry	127,281	144,139	137,258	125,962	84,473	99,058
Howard	4,000	....	....	....	....	3,460
Jackson	....	....	....	4,819	6,720	14,632
Jasper	....	633	....	....	....	....
Johnson	13,187	10,530	10,485	12,101	15,427	8,873
Lafayette	329,845	352,603	347,600	371,928	299,931	256,761
Lincoln	....	....	....	....	....	....
Linn	13,403	28,036	35,588	48,402	61,807	100,179
Livingston	1,100	200	1,000	1,000	800	1.050
Miller	87	130	127	....	....	....
Macon	457,886	454,029	685,335	788,563	511,566	539,120
Moniteau	....	....	....	....	....	....
Morgan	240	488	....	....	....	....
Montgomery	14,744	12,124	16,039	15,923	12,175	10,900
Monroe	108	36	....	....	....	....
Nodaway	....	2.222	1,850	2,548	2,804	1,802
Pettis	....	....	433	181	1,738	....
Putnam	91,584	123,526	134,984	145,641	119,832	111,572
Ralls	675	614	280	2,160	4,400	8,489
Randolph	245,398	224,758	296,011	219,762	209,566	218,774
Ray	*240,462*	282,247	272,948	319,405	196,852	150,998

county producing coal for the past 12½ years.

Fiscal years

1896	1897	1898	1899	1900	Last six months—1900.	Calender year—1901.
23,510	27,078	62,215	104,868	181.577	52,990	347.047
37,511	35.167	36,498	40,759	43,530	19,892	44,066
37,570	70,554	104,233	67.844	141,520	79,295	183,983
375,300	410,304	343,878	441,983	363,577	193.288	372,218
20,428	14,127	16,780	29,665	19.179	8,848	21,549
19,780	20,000	23,000	28,000	26,000	9,186	19,021
22,182	20,152	21,281	23,356	15,120	9,875	21,562
2,304	2,225	803	2,397	1,575	920	1,430
1,000	1,206	1,558	1,321	2,745	....	....
1,863	2,178	1,244	2,116	1,095	770	1,730
355	1,573	3,488	4,517	2,940	1,132	1.447
6,500	9,000	1,500	8,000	12,800	8,944	16,681
....	3,794	3,704	8,600	....	....	2,280
750	250	514	320	1,000	400	1,265
4,570	2,980	4,495	4,930	2,350	2,560	5,393
41,000	35,402	39,974	39,633	42,371	19,619	42,361
78,551	76,023	68,261	81,373	129,902	50,377	103,267
3,230	2,240	....	456	2,944	1,833	3,685
14,532	21,028	15.000	25,125	20,900	7,500	20,000
....	....	....	....	....	....	....
3,961	3,770	4,318	4.710	8,435	4,370	9,695
307,285	284,448	347,857	392,068	377,892	224,465	439.217
....	....	....	....	270	....	....
92,022	67,895	83,041	72,081	81,130	86,508	85,459
1,155	1,468	1.817	800	3.813	667	1,117
....	....	....	....	....	....	....
519,648	490,601	720,999	739,293	597,297	435,413	1,025,213
....	....	....	....	....	....	480
....	6,000	1,440	....	300	900	1,674
10,736	15,200	2,740	2,670	1,675	1,357	1,680
....	....	1,810	960	822	866	1,445
6,065	2,769	1,000	2,350	2.371	1,210	2,000
....	1,470	5,400	3,200	....	....	....
85,032	101,330	121,952	126,673	106,203	79,406	139,456
9,644	7,843	7,768	16,014	20,950	8,100	25,238
290,194	243,012	314,842	354,830	303,133	179,246	432,655
149,093	157,652	215,348	252,683	243,592	137,252	284,900

TABLE V—SHOWING THE ANNUAL PRODUCT OF EACH COUNTY

County.	Number of tons of coal mined—					
	1890	1891	1892	1893	1894	1895
St. Clair	....	3,866	5,405	6,517	5,337	1,000
Saline	660	7,981	4,440	1,865	1,875	3,682
Schuyler	300	280	766	962	3,556	1,620
Shelby	40	8	....	....	....	....
Sullivan	....	560	8,800	1,000	6,600	5,487
Vernon	33,292	64,303	119,096	234,376	297.599	237,965
Totals	2,437,399	2,650,018	3,017.285	3,190,442	2,383,322	2.283,061

PRODUCING COAL FOR THE PAST 12½ YEARS—Continued.

Fiscal years.

1896	1897	1898	1899	1900	Last six months—1900.	Calendar year—1901.
4,058	5,452	3.599	4,210	3,892	2,767	4,539
432	1,281	740	1.320	500	470	942
2,440	2,022	2,921	5,304	4,253	2,522	3,800
....	....	....	....	....	....	....
....	....	....	....	....	....	....
303,886	281,894	252,184	298,382	229,343	114,458	164,972
2,480.147	2,429,368	2,838,152	3,391,811	2,095,022	1,695,846	3,813,527

NOTE.—From 1890 to 1900, inclusive, reports were made for the fiscal year ending June 30. The last six months of 1900 are furnished in order to round out the record, future reports beginning with the year 1901 will cover the calendar year.

TABLE VI—Showing by Counties the Plant, Employes, Tonnage

Counties.	Kind of opening.				No. of mines operated.	Kind of power.				How ventilated.			Mode of working.	
	Shaft	Slope	Drift	Strip-pit		Steam	Horse	Hand	Electricity	Natural	Furnace	Fan	Longwall	Pillar and room
Adair	7	4	3		14	6	7	1		2	6	5	4	10
Audrain	8	2			10	4	6			5	2	3	6	4
Barton	5	3	4	8	20	4	7	6		11	2	6	2	9
Bates	5	8	2	18	33	5	17	6	1	12	6	3	4	12
Boone	3	2	4	2	11	1	3	7		7	4		3	8
Caldwell	2				2	2				1		1	2	
Callaway	7	1	3		11	2	5	3		4	5	2	8	3
Carroll				4	4		2	2						
Cedar			5	2	7		1	6		6	1		2	5
Charlton	1	1	2		4		2	2		3	1		5	1
Clay	1				1	1						1	1	
Cole	2				2		2				2			2
Cooper			1		1			1		1			1	
Dade	2	3			5	1	4			5			5	
Grundy	1				1	1						1	1	
Henry	15	2	2	10	29	9	14	5	1	10	15	2	7	20
Howard			3		3		3			3			2	1
Jackson	1				1	1						1		1
Johnson	2	3	4		9	2		7		8	1			9
Lafayette	25	10	21	2	58	18	13	23	4	15	26	17	52	6
Linn	7				7	3	4			3	3	1	7	
Livingston	2		1		3		2	1		1	2		1	2
Macon	10	4	3		17	10	6	1		1	8	8	1	16
Moniteau	1				1		1			1				1
Monroe			2		2			2		2			2	
Morgan				1	1	1								
Montgomery	2				2		2			2			2	
Nodaway	3				3		3			1	2		3	
Putnam	3	4	10		17	3	5	9		9	6	2	3	14
Ralls	4	1	1	1	7		4	3		3	4		7	
Randolph	11	3	6		20	10	8	2		5	8	7	4	16
Ray	23	1	8		32	13	10	9		5	18	9	32	
St. Clair	2	3	2	3	10		4	6		10			1	9
Saline	1	2			3		1	2		3			3	
Schuyler	2				2	2				1	1		1	1
Vernon	7	4	1	3	15	3	10	2		8	3	4	1	14
Totals	165	61	88	54	368	102	146	106	6	147	127	73	171	164

and value of the Output of the Coal Mines of the State for Year 1901.

Powder.		No. mules worked		Employes.						Tons of coal mined in each county....	Av. price per ton received at mines....	Total amount received at the mines for the output....	Casualties.	
				Miners.		Day and outside men.		Total.						
No. of kegs....	Cost to miners..	Winter.	Summer....	Winter....	Summer....	Winter..	Summer	Winter....	Summer....				Fatal....	Non-fatal....
15,701	$31,402 00	27	21	575	337	227	132	802	469	347,047	$1 17	$406,932	3	2
26	52 00	2	1	137	91	28	19	165	110	44,066	1 44	63,780	....	....
9,423	18,842 05	23	18	378	232	120	71	498	303	183,983	1 15	211,444	1	....
17,363	33,448 25	48	43	420	370	195	157	615	527	372,218	1 04	386,560	....	....
392	784 00	6	3	72	26	16	11	88	37	21,549	1 26	27,135	....	....
....	....	3	2	110	55	20	14	130	69	19,021	1 81	34,515	....	....
....	....	....	....	76	38	19	15	95	53	21,562	1 60	34,417	....	....
18	36 00	....	....	......	......	5	8	5	8	1,430	1 84	2,630	....	....
33	60 00	2	1	15	......	......	......	15	......	1,730	1 26	2,188	....	....
40	80 00	....	....	8	4	1	4	9	8	1,447	1 80	2,617	....	....
....	....	2	1	50	40	12	8	62	48	16,681	1 50	25,021	....	....
....	....	2	....	9	......	3	......	12	......	2,280	1 50	3,420	....	....
2	4 50	....	....	5	2	2	1	7	3	1,265	2 25	2,846	....	....
....	....	....	....	40	8	2	......	42	8	5,393	1 40	7,589	....	....
....	....	8	7	160	130	36	30	196	160	42,361	1 84	77,946	....	....
2,873	5,735 75	9	10	276	210	75	58	351	268	103,267	1 50	154,385	....	....
....	....	....	....	19	15	3	2	22	17	3,685	1 90	6,928	....	....
....	....	4	3	90	50	25	18	115	68	20,000	2 50	50,000	....	....
31	62 25	....	....	36	18	6	3	42	21	9,695	1 53	14,983	....	....
70	140 00	79	46	1,570	813	335	188	1,905	1,001	439,217	1 62	709,849	....	....
....	....	....	11	234	182	44	40	278	222	85,459	1 62	138,529	....	....
....	....	....	....	10	2	2	1	12	3	1,177	2 25	2,651	....	....
35,912	71,824 00	76	66	1,580	1,526	521	576	2,101	2,102	1,025,213	1 01	1,042,327	7	10
....	....	1	....	4	......	......	......	4	......	480	1 50	720	....	....
4	11 00	....	....	6	4	......	......	6	4	1,445	1 20	1,736	....	....
40	80 00	....	....	4	4	......	......	4	4	1,674	1 50	2,511	....	....
7	14 00	....	....	10	1	......	1	10	2	1,680	1 69	2,790	....	....
....	....	....	....	13	6	3	2	16	8	2,000	2 50	5,000	....	....
....	....	24	23	439	316	89	79	528	395	139,456	1 39	192,530	....	....
7	14 00	2	2	70	54	12	9	82	63	25,238	1 22	31,015	....	....
10,303	20,395 25	37	32	767	646	204	174	971	820	432,655	1 11	480,745	1	4
....	....	38	26	896	574	172	118	1,068	692	264,900	1 59	405,708	....	....
54	106 00	....	....	27	10	8	3	35	13	4,539	1 74	7,908	....	....
....	....	....	....	9	2	......	......	9	2	942	1 94	1,830	....	....
3	5 50	2	2	18	15	4	4	22	19	3,800	1 30	4,900	....	....
8,320	16,588 25	27	23	221	187	123	72	344	259	164,972	1 03	170,246	3	....
100,622	$199,684 80	422	341	8,354	5,968	2,312	1,818	10,666	7,786	3,813,527	$1 24	$4,716,331	15	16

TABLE VII—Showing by Counties, kind and number of coal mines for mining and prices received for the coal at the mines, total out-

ADAIR

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Kind of opening				Depth of shaft	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan diam.
1	American Fuel Co. M. No. 1	American Fuel Co.	196			1			3	6		1				1	
2	Besanko Robt.	Robt. Besanko	270	1				45	4	4		1				1	
3	Culler Bro's. (Culler Mine)	Thos. Scott	70		1				3	10		1			1		
4	C. B. Havens (Danforth)	C. B. Havens & Co.	271	1				50	3	8	1						15
5	K. C. Midland C. & M. Co.	K. C. Midland, C. & M. C.	223	2				80 150	3 3	1 8	2						36
6	McCabe, Patrick	McCabe, Pattrick	120	1				25	4			1				1	
7	Manf. C. & C. Co. M. 1 & 2.	Manufactures, C. & C. Co	85		1				3	10	1						10
8	Motter Noah (Miller Mine).	F. J. Miller	106		1				4			1				1	
9	Oak Block Coal Co. (Cor.).	Oak Block Coal Co. (Cor.)	230			1			3	6		1				1	
10	Paris, John	John Paris	28			1			3	6			1		1		
11	Rombauer Coal Co.	Rombauer Coal Co. M. 1.						50									10
		Rombauer Coal Co. M. 2.	192	2				72	3	6	2						12
12	Scott & Son (Hazel Creek).	D. C. Scott	140		1				4			1				1	
			1,931	7	4	3	..	....	..	..	6	7	1	..	2	6	5

AUDRAIN

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Kind of opening				Depth of shaft	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan diam.
1	Bevan, Wm. (Curver Creek Mine.)	Wm. Bevan	80	1				35	2	4		1				1	
2	Carr, Paris	Paris Carr	120		1			17	2	8		1			1		
3	Farber Mine	Lawder & Peterson	260	1				104	2	6	1						7
4	Hafner, O. F. (Worcester Mine)	Jos. Holtkamp	240	1	1			12	2	8		1			1		
5	Johnston, R. E. (McGuire Mine)	G. W. McGuire	120	1				43	2	8		1			1		
6	Krieger Coal Co	Oscar Krieger	240	1				110	2	6	1					1	
7	Standard Coal Co	Joe. Sanford	225	1				73	2	4		1			1		
8	Mississippi Glass Co	Mississippi Glass Co	135	1				65	2	4	1						48
9	Vandalia Coal Co	Vandalia Coal Co	210	1				75	2	4	1						8
			1,630	8	2	..	..	....		..	4	6	..	..	5	2	3

BARTON

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Kind of opening				Depth of shaft	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan diam.
1	Bell, J. W.	J. W. Bell	40			1			1				1		1		
2	Chancelor, H. C., Sr	Joxie Brown	120				1		2			1	1		1		
3	Divine, W. B.	W. B. Divine	60			1			1	2			1		1		
4	Gray Coal Co.	F. R. Gray	108				1		3	4		1			1		
5	Hanshaw, W. H.	W. H. Hanshaw	90				1										
6	Lasby, M.	G. W. Claunch	270				1		3	4		1			1		
7	Miller, W. L.	Sanford Bro Mer. Co.	167				1										
8	Prosser, J. J.	Prosser, Sanders & Sanders	70		1		1		2	4			1		1		
9	Richards, Louise Mrs.	C. A. Richards	55				1		2	4		1			1		
10	Spear, M. M.	M. M. Spear	50				1		1	2							
11	Stockton, E.	E. Stockton	60		1				2	4			1		1		
12	Travis Mine	Joe Travis	90	1				20	2	3		1			1		
13	Van Felt, C.	C. F. Swigert	192	1				33	2	8		1				1	
14	Walser, G. H.	Rogers & Nicholson	200			1			2	6		1			1		5
15	Walser, G. H.	Geo. Mellor	70			1			2	4			1		1		
16	Wear Coal Co., Mine No. 3	Wear Coal Co	222	1				44	3		1						10
17	Wear Coal Co., Mine No. 10	Wear Coal Co	57	1				38	3		1						12
18	West'n Coal Co., Mine No. 8	Western Coal Co	244	1				56	3		1						16
19	West'n Coal Co., Mine No. 9	Western Coal Co. (Hall & Fletcher	255		1				2	10	1					1	
			2,420	5	3	4	8	....	..	..	4	7	6	..	11	2	4

operated, working plan, kind of plant, number of employes, prices paid put and total receipts from the sale of the product for the year 1901.

COUNTY.

Long-wall	Pillar and room	Amount of powder used and cost of same.		Mules worked.		Employes.						Price paid for mining.		Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
						Miners.		Others.		Total.							
		No. of kegs.	Cost	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer				
1				14	14	94	73	27	27	121	100	$ 82	$ 82	38,951	$1 43	$55,931	1
..	1					10	....	2	....	12	....	80	80	5,785	1 37	7,231	2
..	1	8	$16 00			2	....	1	....	3	....	80	80	300	1 25	375	3
..	1	5,600	11,200 00			110	24	80	16	190	40	65	65	102,030	1 13	116,364	4
2	..	2,919	5,838 00	13	7	70	70	35	35	105	105	70	70	42,432	1 20	50,000	5
..	1					10	....	2	....	12	....	80	80	2,800	1 25	3,500	6
..	1	930	1,860 00			68	....	18	....	86	....	65	....	18,531	1 20	22,237	7
..	1					7	....	1	....	8	....	80	....	1,258	1 31	1,651	8
1	..					40	20	8	4	48	24	82	82	15,000	1 50	23,000	9
..	1	15	30 00			4	....	1	....	5	....	75	75	230	1 25	287	10
..	..	....	....	..	..	....	....	....	....	....	....	....	....	....	....	....	....
..	2	6,229	12,458 00			150	150	50	50	200	200	65	65	115,530	1 05	121,106	11
..	1					10	....	2	....	12	....	77	77	4,200	1 25	5,250	12
4	10	15,701	$31,402 00	27	21	575	337	227	132	802	469			347,047	$1 17	$406,932	....

COUNTY.

1	..			..	..	3	....	1	....	4	....	$1 00	$1 00	300	$1 50	$450	1
..	1			..	..	3	1	1	....	4	1	75	75	520	1 25	650	2
1	...	2	$4 00	2	1	30	20		4	34	24	91	91	13,000	1 47	19,110	3
1	1	4	8 00	..	..	4	2	....	....	4	2	1 12	1 00	864	1 50	1,296	4
..	1			..	..	6	....	2	....	8	....	75	75	1,200	1 25	1,500	5
1	...	20	40 00	..	..	25	16	6	5	31	21	91	91	6,041	1 45	10,228	6
1	..			..	..	16	12	2	2	18	14	91	91	4,384	1 50	6,576	7
1	..			..	..	10	10	2	2	12	12	91	91	2,800	1 35	3,780	8
..	1			..	..	40	30	10	6	50	36	91	91	14,957	1 35	20,190	9
6	4	26	52 00	2	1	137	91	28	19	165	110			44,066	$1 44	$63,780	

COUNTY.

..	1			..	2	2	....	2	....	4	....	$1 50	$1 50	120	$2 00	$240	1
..	..			..	..	....	....	6	....	6	....	90	90	1,296	1 47	1,905	2
..	1			..	..	4	....	2	....	6	....	1 00	1 00	200	1 50	300	3
..	..			..	..	....	....	10	....	10	....	....	....	2,160	1 50	3,240	4
..	..			..	..	3	....	....	....	3	....	65	65	552	1 25	690	5
..	..	12	$22 80	..	..	1	1	3	3	4	4	....	....	2,000	1 15	2,300	6
..	..			..	..	9	....	....	....	9	....	65	65	3,004	1 25	3,755	7
..	..			..	..	2	2	....	....	2	2	70	70	280	1 25	350	8
..	..	11	19 25	..	..	4	....	....	....	4	....	....	....	550	1 25	687	9
..	..			2	..	3	....	....	....	3	....	1 25	1 25	160	2 25	360	10
..	1			..	..	....	....	1	....	1	....	....	....	120	1 25	150	11
..	1			..	..	2	....	....	....	2	....	....	....	211	1 25	263	12
..	1	326	652 00	1	1	10	5	4	2	14	7	65	65	3,268	1 20	3,921	13
..	1			1	1	8	5	2	1	10	6	65	65	1,700	1 25	1,955	14
..	1			..	..	....	2	....	....	....	2	65	65	230	1 20	276	15
..	1	3,031	6,062 00	5	6	65	75	24	25	89	100	65	65	58,884	1 15	67,716	16
..	1	836	1,672 00	5	..	108	....	26	...	134	....	65	65	16,493	1 15	18,966	17
..	1	4,408	8,816 00	6	6	122	122	36	36	158	158	65	65	74,755	1 15	86,370	18
..	1	790	1,598 00	2	2	35	20	4	4	39	24	65	65	18,000	1 00	18,000	19
..	11	$9,423	$18,842 05	23	18	378	232	120	71	498	303	....	....	183,983	$1 15	$211,444	....

STATISTICS OF

BATES

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Kind of opening.				Depth of shaft	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan-diam.
1	Ackerman, Jas	Jas. Ackerman	90				1		2	06							
2	Brooks, J. J	J. J. Brooks	244		1				4	00	1	1			1		
3	Craig, T. A	T. A. Craig	100				1		3	04							
4	Darby, J. W	W. H. Mace	250		1				3	04		1				1	
5	Engels, L. G	J. T. Engels	110	1				40	4	06		1			1		
6	Kas., Mo., Land & C. Co.	W. W. Peeler	225				1		4	06		1			1		
7	Lewis, O. H	Harris Gerrodo	90	1	1		1	16	2	10	1		1		1		
8	Martin, F. M	F. M. Martin	260				1		2	00							
9	Metzler Coal Co	Metzler Coal Co	20				1		3	02		1	1		1		
10	Mo. Pac. R. R. Co.	J. Newcomb	90				1		3	06		1			1		
11	Parker, L. W	E. C. Hines	120				1		2	00			1		1		
12	Pearson, Peter	Peter Pearson	263				1		5			1			1		
13	Prose Mine	Briscoe & Prose Co	90				1		3	02							
14	Rankin Mine.	B. Cooper	15				1		2	06							
15	Rich Hill Coal Co	Rich H. C. Co., M. No. 15.	226	1				105	3	10	1			1			15
16	" "	" " 22.	266		1				3	00	1						8
	" "	Contract Mines															
17	" "	Berteau Bros	104		1				4	00		1				1	
18	" "	J. O. Griggs	175				1		4	06		1					
19	" "	W. H. Lowder	30				1		4	08		1					
20	" "	D. McComb.	30			1			5	00		1			1		
21	" "	R. Pearson	173		1				4	03		1				1	
22	" "	D. Reese	180		1				4	06		1				1	
23	" "	Vernon Coal Co	240	1				130	3	03	1						12
24	Scott, Sarah	Hensley & Mullis	50				1		3	04							
25	Selders Bros	Selders Bros	80				1		3	04			1		1		
26	Steele, D. W	D. W. Steele	150	1				38	3	00		1				1	
27	Tatley, J. V. Coal Co	J. V. Tatley	220			1			2	10		1	2			1	
28	Thomas Mark	Mark Thomas	100				1		3	03		1			1		
29	Walnut Land and Coal Co.	C. T. Bishop	50		1				3	00		1			1		
30	" "	S. L. Queen	64				1		3	00							
31	Western Coal and Mining Co	J. O. Rankin	90				1		2	10							
			4,195	5	8	2	18				5	17	6	1	12	6	3

BOONE

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan-diam.
1	Beasley, W. H	Johhn Gossett	56			1			3	06			1		1		
2	Buckler, H. T	H. T. Buckler	120		1				4	00			1		1	1	
3	Columbia Coal Co	R. E. Henry	180	1				55	3	00	1					1	
4	Davis, I. R	Isaac R. Davis	60		1				3	04		1			1		
5	Gilvin mine	J. R. Gilvin	90			1			3	00			1		1		
6	Keene, J. H	Jas. H. Keene	241	1				127	3	06		1				1	
7	McKenzie, J. F	J. F. McKenzie	30			1			4	00			1		1		
8	Prather, S. S	W. R. Prather	206	1					3	08		1				1	
9	Robinson, J. W	T. B. Hord	90				1		3	06			1		1		
10	Sublett, S. T	S. T. Sublett	60				1		2	06			1		1		
11	White Bros	J. H. & Wm. White	70			1			3	08			1		1		
			1.203	3	2	4	2				1	3	7		7	4	

CALDWELL

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan-diam.
1	Caldwell Coal Co	Caldwell Coal Co	223	1				527	1	08	1						10
2	Dripping Springs Coal Co.	Dripping Spr'gs Coal Co.	123	1				240	1	06	1				1		
			346	2							2				1		1

COAL MINES—Continued.

COUNTY

Long-wall	Pillar and room	Amount of powder used and cost of same.		Mules worked.		Employes.						Price paid for mining.		Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
		No. of kegs	Cost	Winter	Summer	Miners		Others		Total		Winter	Summer				
						Winter	Summer	Winter	Summer	Winter	Summer						
..	..	4	$8 00	..	..	....	....	4	....	4	....	$ 75	$ 75	1,000	$1 25	$1,250	1
.	1	120	210 00	..	..	4	4	1	1	5	5	75	....	2,189	1 25	2,755	2
..	..	35	59 50	..	..	3	4	7	....	10	....	....	....	2,420	1 25	3,025	3
..	..	115	191 25	2	1	10	8	8	4	18	12	45	45	3.750	1 25	4,687	4
..	1	72	144 00	..	..	8	....	2	....	10	....	55	55	1,800	1 25	2,250	5
..	1	20	35 00	..	.	....	....	3	....	3	....	75	75	1,045	1 50	1,567	6
..	1	13	22 75	..	..	2	....	....	....	2	....	75	....	600	1 40	640	7
..	..	20	37 50	..	.	2	3	....	....	2	3	75	....	1,226	1 00	1,226	8
..	..	10	17 50	..	..	....	....	6	....	6	....	75	75	400	1 00	500	9
..	..	5	8 25	..	.	....	....	2	....	2	....	75	75	410	1 25	553	10
..	..	30	52 50	..	..	....	....	4	....	4	....	75	75	1,000	1 00	1,000	11
..	..	129	225 75	3	..	....	....	3	3	3	3	55	55	2,280	1 00	2,282	12
..	..	4	7 00	..	..	3	....	....	....	3	....	75	....	500	1 25	625	13
..	..	4	7 00	..	..	2	....	....	....	2	....	75	....	60	1 00	60	14
..	1	9,249	18,498 00	20	20	180	180	97	97	277	277	55 60	55 60	194,430	1 01	195,392	15
..	1	1,361	2,722 00	3	3	25	25	8	8	33	33	55 60	55 60	23.006	1 04	24,144	16
..	..	......	....	..	..	....	....	....	....	....	....	....	....	....	......	....	....
..	1	......	....	..	..	....	....	....	....	....	....	....	....	....	....	....	17
..	..	......	....	..	..	....	....	....	....	....	....	....	....	....	....	....	18
..	..	5,605	10,210 00	18	18	138	138	41	42	179	180	55 60	55 60	122,347	1 04	127,400	19
..	1	......	....	..	..	....	....	....	....	....	....	....	....	....	....	....	20
..	1	......	....	..	..	....	....	....	....	....	....	....	....	....	....	....	21
..	1	......	....	..	..	....	....	....	....	....	....	....	....	....	....	....	22
..	1	......	....	..	..	....	....	....	....	....	....	....	....	....	....	....	23
..	.	6	10 50	..	.	2	....	....	....	2	....	75	....	300	1 10	330	24
..	1	27	47 25	..	..	5	....	3	...	8	....	55 60	55 60	816	1 25	1,020	25
..	1	185	323 75	..	..	8	5	2	1	10	6	50	50	2.800	1 35	3.500	26
..	..	300	525 00	1	1	16	7	3	1	19	8	55	55	7,961	1 25	9,951	27
..	1	9	15 75	..	..	2	....	....	...	2	....	75	....	400	1 40	560	28
..	1	30	52 50	1	..	3	....	....	....	3	....	50	50	316	1 20	379	29
..	..	6	10 50	..	..	3	....	....	....	3	....	55	55	400	1 50	600	30
..	..	4	7 00	..	..	4	....	1	....	5	....	75	....	760	1 15	864	31
..	15	17,363	$33,448 25	48	43	420	370	195	157	615	527	....	....	372,218	$1 04	$386.560	....

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	2	$4 00	..	..	2	....	....	....	2	....	80	80	250	$1 30	$325	1
..	1	....	....	..	..	4	....	....	....	4	....	75	75	960	1 00	960	2
1	1	75	150 00	2	1	18	10	6	5	24	15	80	80	5,000	1 40	7.000	3
..	1	10	20 00	..	..	2	....	1	....	3	....	75	75	250	1 12	280	4
..	..	....	....	..	..	3	....	1	....	4	....	70	70	562	1 00	562	5
..	1	191	382 00	2	1	14	9	4	2	18	11	80	80	6.969	1 32	9,041	6
..	..	....	....	..	..	....	....	....	3	....	3	80	75	200	87	175	7
1	..	110	220 00	1	1	20	7	3	1	23	8	80	75	6,016	1 25	7,520	8
1	..	4	8 00	..	..	4	....	....	....	4	....	75	75	600	1 00	600	9
..	1	....	....	..	..	1	....	1	....	2	....	75	75	120	1 25	150	10
..	1	....	....	..	..	4	....	....	....	4	....	75	75	622	1 00	622	11
3	7	392	$784 00	6	3	72	26	16	11	88	37	....	....	21.549	$1 26	$27,135	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
1	..	....	....	3	2	80	40	14	10	94	50	$1 25	$1 25	15,591	$1 58	$25,940	1
1	..	....	....	..	..	30	15	6	4	36	19	1 35	1 35	3,430	2 50	8,575	2
2	..	....	....	3	2	110	55	20	14	130	69	....	....	19,021	$1 81	$34,515	

STATISTICS OF

CALLAWAY

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Kind of opening.				Depth of shaft	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Castle, Wm	Wm. Castle	258	1	..	1	..	55	2	4	..	..	1	..	1	..	..
2	Curd, Edwin	Edwin Curd	144	..	..	1	..	....	2	8	..	..	1	..	..	1	..
3	Curd, Edwin	John Marsinkhoff	160	1	..	..	..	30	2	..	..	1	..	..	..	1	..
4	Fulton Fire Brick Co	F. F. B. & M. Co	142	1	..	..	..	100	2	4	1	..	..	..	..	..	60
5	Harris, John	John Harris	298	1	..	..	..	40	2	6	..	1	..	..	1	..	..
6	Horner, Jos	R. F. Thorp	210	..	1	..	..	....	2	6	..	1	..	..	..	1	..
7	Reed, J. F	J. F. Reed	125	1	..	..	..	12	3	..	..	1	..	..	1	..	..
8	Smith, Jas	Jas. Smith	165	..	..	1	..	....	2	8	..	..	1	..	..	1	..
9	Smith, Jas	Wm. Simmons	200	1	..	..	..	50	2	8	..	1	..	..	..	1	..
10	Sims Bro's Coal Co	Sims Bros. Coal Co	250	1	..	..	..	100	3	..	1	..	..	..	..	..	5
			1,952	7	1	3	..	....	..	..	2	5	3	..	3	5	2
	CARROLL																
1	Farr, Robt	Robt. Farr	120	..	..	..	1	....	2	..	..	..	..	..	..	..	..
2	Gallaher, W. P	W. R. Gallaher & B. White	70	..	..	..	1	....	2	2	..	..	..	..	..	..	..
3	Hughes, Wm	Wm. Hughes	60	..	..	..	1	....	1	10	..	1	..	..	1	..	..
4	Ogle, W. F	W. F. Ogle	190	..	..	..	1	....	1	8	..	1	..	..	..	..	..
			440	..	..	..	4	....	..	..	..	2	..	..	1	..	..
	CEDAR																
1	Beebe, E. M	Beebe, E. M	302	..	..	..	1	....	1	8	..	1	..	..	1	..	..
2	Duncan, J. C	H. Parvin	60	..	..	1	..	....	2	..	..	..	1	..	1	..	..
3	Dial, J. Mrs	John Conner	10	..	..	1	..	....	2	2	..	..	1	..	..	1	..
4	Poague, G. M	G. M. Poague	60	..	..	1	..	....	2	4	..	..	1	..	1	..	..
5	Schroder, C. M.	C. M. Schroder	90	..	..	..	1	....	1	8	..	..	1	..	1	..	..
6	Smith, Wm	Wm. Smith.	50	..	..	1	..	....	1	2	..	..	1	..	1	..	..
7	Young, J. H	G. A. Smith	25	..	..	1	..	....	3	..	..	..	1	..	1	..	..
			597	..	..	5	2	....	..	..	..	1	6	..	6	1	..
	CHARITON																
1	Huenten, John	Robt. Brewer	90	..	1	..	..	....	1	6	..	..	1	..	1	..	..
2	Isle, R. W	R. W. Isle	10	..	..	1	..	....	1	5	..	..	1	..	1	..	..
3	Kahler, W. J	W. J. Kahler	15	..	..	1	..	....	1	6	..	1	..	..	1	..	..
4	Wachter, H	H. Wachter	200	1	..	..	..	65	2	6	..	1	..	..	..	1	..
			315	1	1	2	..	....	..	..	..	2	2	..	3	1	
	CLAY																
1	Missouri City Coal Co	Missouri City Coal Co	229	1	..	..	1	56	1	9	1	..	..	..	..	..	10
	COLE																
1	Edwards & Kauffman	Edwards & Kauffman	82	1	..	..	..	66	27	..	..	1	..	..	..	1	..
2	Urban, Wm	Wm. Urban	71	1	..	..	..	50	18	..	..	1	..	..	..	1	..
			153	2	..	..	..	....	..	..	..	2	..	..	..	2	..

COAL MINES—Continued.

COUNTY.

Pillar and room	Long-wall	Amount of powder used and cost of same. No. of kegs	Amount of powder used and cost of same. Cost	Mules worked. Winter	Mules worked. Summer	* Employes. Miners. Winter	* Employes. Miners. Summer	* Employes. Others. Winter	* Employes. Others. Summer	* Employes. Total. Winter	* Employes. Total. Summer	Price paid for mining. Winter	Price paid for mining. Summer	Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
1						7	2	1	1	8	3	$1 10	$1 10	1,890	$1 60	$3,024	1
1						6				6		1 12	1 12	1,040	2 06	2,142	2
1						4				4		1 00	1 00	1,080	1 50	1,620	3
1						20	20	10	10	30	30	1 06	1 06	4,250	1 35	5,737	4
1						7	3	2	1	9	4	1 06	1 06	3,000	1 50	4,500	5
	1					3				3		1 06	1 06	1,000	1 50	1,500	6
	1					6		2		8		1 00	1 00	1,500	1 37	2,062	7
1						7	3	1	1	8	4	1 06	1 06	1,600	2 06	3,296	8
1						8	4	1	1	9	5	1 06	1 06	2,202	2 06	4.536	9
1						8	6	2	1	10	7	1 06	1 06	4,000	1 50	6,000	10
8	2					76	38	19	15	95	53			21,562	$1 60	$34,417	

COUNTY.

1		8	16 00						2		2	$1 25	$1 25	360	$1 75	$630	1
1		6	12 00						3		3			320	1 50	500	2
1		4	8 00					2		2				120	2 00	240	3
1								3	3	3	3			630	2 00	1,260	4
4		18	$36 00					5	8	5	8			1,430	$1 84	$2,630	

COUNTY.

1		30	$54 00	2	1	2				2		75	75	800	$1 12	$900	1
	1					2				2				130	1 62	211	2
	1					2				2		75	75	30	1 25	37	3
	1					2				2		1 25	1 25	150	1 50	225	4
1						3				3		75		400	1 25	500	5
	1					2				2		1 25	1 50	160	1 50	240	6
	1	3	6 00			2				2		1 00	1 00	60	1 25	75	7
2	5	33	$60 00	2	1	15				15				1,730	$1 26	2,188	

COUNTY.

1						2				2		1 25	1 25	270	$2 00	$540	1
1									2		2			20	2 00	40	2
1									1		1			17	2 50	42	3
	1	40	$80 00			6	4	1	1	7	5	1 18	1 18	1,140	1 75	1,995	4
3	1					8	4	1	4	9	8			1,447	$1 80	$2,617	

COUNTY.

1				2	1	50	40	12	8	62	48	$1 00	95	16,681	$1 50	$25,021	1

COUNTY.

	1			1		6		2		8		$1 10		1,640	$1 50	$2,460	1
	1			1		3		1		4		1 10		640	1 50	960	2
	2			2		9		3		12				2,280	$1 50	$3,420	

STATISTICS OF

COOPER

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Kind of opening				Depth of shaft.	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Hazel Springs Coal Mines.	C. W. Hazell	200	..	1	..	..	....	1	6	..	..	1	..	1	..	..

DADE

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Shaft	Slope	Drift	Strip-pit	Depth of shaft.	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Hickman, O	A. Leonard	200	..	1	..	..	....	2	4	..	1	..	..	1	..	..
2	McCluey, Robt	Robt. McCluey	90	..	1	..	..	....	3	..	..	1	..	..	1	..	..
3	" "	J. A. Clayton	50	..	1	..	..	....	2	2	..	1	..	..	1	..	..
4	McElhinney, B. D	Finney & Simmonds	105	1	..	..	..	24	2	..	1	..	..	..	1	..	..
5	McCombs Mine	Thos. Gardner	112	1	..	..	..	40	2	6	..	1	..	..	1	..	..
			565	2	3	..	..	....	..	..	1	4	..	..	5	..	..

GRUNDY

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Shaft	Slope	Drift	Strip-pit	Depth of shaft.	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Grundy County Coal Co	Grundy County Coal Co.	235	1	..	..	..	174	1	6	1	..	..	..	..	..	10

HENRY

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Shaft	Slope	Drift	Strip-pit	Depth of shaft.	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Beedy, M	W. E. Hughes	175	1	..	..	..	25	4	6	..	1	..	..	..	1	..
2	Bigum Mine	Reese & Bigum	56	1	..	..	..	30	2	9	..	1	..	..	..	1	..
3	Blair, John O	Cooper Creek Coal Co	220	1	..	..	..	26	3	0	..	1	..	..	..	1	..
4	Bowen Bro	Bowen Bro	300	1	..	..	..	35	2	6	1	..	..	..	..	1	..
5	Burgess, L. L	L. L. Burgess	60	..	..	..	1	..	2	0	..	..	..	..	..	..	..
6	Chappell, J. R	C. W. Field	68	..	..	..	1	....	3	6	..	..	..	1	..	..	..
7	Clark, David	David Clark	60	..	..	..	1	....	1	2	..	1	1	..	..	..	..
8	Co-operative Coal Co	Co-operative Coal Co	226	1	..	..	..	76	2	6	1	..	..	..	..	..	12
9	Daley, G. G	E. A. Barnharf	165	1	..	..	..	25	2	0	..	1	..	..	1	..	..
10	Demaree, H. T	H. T. Demaree	138	..	..	..	1	....	3	0	..	1	..	..	..	1	..
11	Dickey, W. S. Clay Mfg. Co	W. S. Dickey, Clay Mfg. Co	264	..	1	..	..	....	3	0	1	..	..	..	..	1	..
12	Eugeman, Chas	Chas Eugeman	180	..	..	..	1	....	2	0	..	1	1	..	1	..	..
13	Geahart, Theo	Theo. Geahart	30	..	..	..	1	....	4	0		1	..	..	1	..	..
14	Hines, F. B	C. W. Field	60	1	..	..	..	35	4	0	..	1	..	..	1	..	..
15	Hobbs, H. B	Denzler & Church Coal Co	80	..	1	..	..	....	3	0	..	1	..	..	..	1	..
16	Hurst, Jas	J. Hurst	196	1	..	..	..	52	3	0	1	..	..	..	..	1	..
17	Jordan Coal Co	Jordan Coal Co	212	1	..	..	..	35	2	8	..	1	..	..	..	1	..
18	Miller, W. J	L. M. Beaman	300	1	..	..	..	40	5	0	..	1	..	..	1	..	..
19	Owen, J	C. Ghupert & Grover	60	..	..	1	1	....	2	6	..	..	1	..	1	..	..
20	Owen, W. E	E. A. Barnehart	120	1	..	..	..	30	2	0	..	1	..	..	..	1	..
21	Rigg, D. B	Chapman & Dalton	211	..	..	1	..	....	2	8	..	..	1	..	..	1	..
22	Rusk, Wm	C. Roady	130	1	..	..	..	35	2	6	1	..	..	..	1	..	..
23	Salmon & Salmon	Wm. Reese	109	1	..	..	..	36	2	6	1	..	..	..	..	1	..
24	Smith, J. W	J. W. Smith	100	1	..	..	..	23	2	8	1	..	..	..	..	1	..
25	Teeman, Jno	Jno. Teeman	37	..	..	..	1	....	2	0	1	..	..	..	1	..	..
26	Thompson, Jno	Jno. Thompson	180	1	..	..	..	65	3	4	1	..	..	..	..	..	10
27	Tyree, Jos	Jas. Tyree	175	..	..	..	1	....	1	0	..	1	..	..	1	..	..
28	Wilson, Thos. P	Hurt & O'Neal	60	..	..	..	1	....	1	6	..	..	1	..	1	..	..
			3,972	15	2	2	10	....	..	..	9	14	5	1	10	15	2

COAL MINES—Continued.

COUNTY.

Long-wall	Pillar and room	Amount of powder used and cost of same. No. of kegs	Amount of powder used and cost of same. Cost	Mules worked Winter	Mules worked Summer	Employes. Miners. Winter	Employes. Miners. Summer	Employes. Others. Winter	Employes. Others. Summer	Employes. Total. Winter	Employes. Total. Summer	Price paid for mining. Winter	Price paid for mining. Summer	Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
1	1	2	$4 50	..	..	5	2	2	1	7	3	$1 50	$1 37	1,265	$2 25	$2,846	1

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
.	1	....	....	..	..	10	8	....	....	10	8	$ 75	$ 75	2,000	$1 25	$2,500	1
..	1	....	....	..	..	4	....	1	....	5	....	1 00	1 00	80	1 50	120	2
..	1	....	....	..	..	6	....	....	....	6	....	1 00	1 00	250	1 50	375	3
..	1	....	....	..	..	10	....	....	....	10	....	1 00	1 00	1,600	1 50	2,400	4
..	1	....	....	..	..	10	....	1	....	11	....	1 00	1 50	1,463	1 50	2,194	5
	5	....	....	..	..	40	8	2		42	8	....	....	5,393	$1 40	$7,589	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	....	....	8	7	160	130	36	30	196	160	1 15	1 15	42,361	$1 84	$77,946	1

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	......	....	..	..	3	...	1	....	4	....	$ 75	$ 75	935	$1 75	$1,636	1
..	1	15	$30 00	..	..	5	....	....	....	5	....	75	75	450	1 60	720	2
	1	250	500 00	..	..	16	12	2	2	18	14	90	1 55	7,960	1 55	12,388	3
1	..	5	10 00	..	2	30	30	7	7	37	37	80	80	17,578	1 32	23,202	5
..	..	....	....	..	..	....	...	2	....	2	....	....	....	180	1 50	270	4
1	..	....	....	2	1	3	....	....	....	3	....	75	75	378	1 62	614	6
1	..	1	2 00	..	..	2	....	....	....	2	....	....	....	200	1 25	250	7
1	..	....	....	..	..	27	18	8	7	35	25	80	80	8,528	1 33	11,370	8
..	1	....	....	..	..	5	2	1	1	6	3	1 00	100	900	1 50	1,350	9
..	1	100	200 00	..	..	11	8	4	2	15	10	95	95	3,078	1 50	4,617	10
..	1	723	1,446 00	3	3	24	24	9	9	33	33	85	85	15,325	1 60	24,520	11
1	..	1	2 00	2	2	2	1	....	....	2	1	....	....	300	1 75	630	12
1	..	10	17 50	.	..	2	....	3	....	5	....	....	....	285	1 12	321	13
..	1	19	38 00	..	..	3	....	1	....	4	....	75	75	486	1 25	607	14
..	1	40	80 00	..	..	4	....	4	....	8	....	95	95	800	1 60	1,280	15
..	1	280	560 00	..	..	13	13	2	1	15	14	95	95	4,006	1 70	6,940	16
..	1	774	1,548 00	1	1	45	40	7	7	52	47	85	85	11,693	1 61	18,827	17
..	1	130	260 00	..	..	18	8	4	4	22	12	62	62	10,802	1 50	16,203	18
..	1	3	5 25	..	..	3	1	....	....	3	1	1 00	1 00	340	1 50	510	19
..	1	30	52 50	..	..	6	4	2	2	8	6	1 00	1 00	1,080	1 50	1,620	20
1	..	....	....	1	1	25	25	10	10	35	35	80	70	8,000	1 40	11,200	21
..	1	....	....	..	..	5	1	1	....	6	1	80	80	963	1 50	1,440	22
..	1	250	500 00	..	.	12	18	2	3	14	21	1 15	1 05	4,800	1 60	7,680	23
..	1	....	....	..	..	2	....	....	....	2	....	....	....	300	1 50	450	24
..	1	1	2 00	..	..	....	....	...	2	....	2	....	....	110	2 00	220	25
...	1	240	480 00	..	..	10	5	1	1	11	6	....	....	3,200	1 45	4,640	26
..	1	1	2 50	..	..	...	....	2	...	2	....	....	....	350	2 00	700	27
..	1	....	....	..	..	..	.. .	2	..	2	....	....	....	120	1 50	180	28
7	20	2,873	$5,735 75	9	10	276	210	75	58	351	268	....	....	103,267	$1 50	$154,385	

STATISTICS OF

HOWARD

Office number	Name of company or mine owner.	Name of operator.	No. days worked	Kind of opening: Shaft	Kind of opening: Slope	Kind of opening: Drift	Kind of opening: Strip-pit	Depth of shaft	Thickness of coal: Feet	Thickness of coal: Inches	Kind of power: Steam	Kind of power: Horse	Kind of power: Hand	Kind of power: Electricity	How ventilated: Natural	How ventilated: Furnace	How ventilated: Fan—diam.
1	W. R. Graham	W. R. Graham	258			1			1	06			1		1		
2	Lockridge, B. M.	Jno. Hinch	208			1			2	00			1		1		
3	Morrison, A. W.	R. S. Jackson	99			1			1	06			1		1		
			565			3							3		3		

JACKSON

Office number	Name of company or mine owner.	Name of operator.	No. days worked	Kind of opening: Shaft	Kind of opening: Slope	Kind of opening: Drift	Kind of opening: Strip-pit	Depth of shaft	Thickness of coal: Feet	Thickness of coal: Inches	Kind of power: Steam	Kind of power: Horse	Kind of power: Hand	Kind of power: Electricity	How ventilated: Natural	How ventilated: Furnace	How ventilated: Fan—diam.
1	Brush Creek Mine	Brush Creek C. M. Co.	264	1				465	1	09	1						10

JOHNSON

Office number	Name of company or mine owner.	Name of operator.	No. days worked	Kind of opening: Shaft	Kind of opening: Slope	Kind of opening: Drift	Kind of opening: Strip-pit	Depth of shaft	Thickness of coal: Feet	Thickness of coal: Inches	Kind of power: Steam	Kind of power: Horse	Kind of power: Hand	Kind of power: Electricity	How ventilated: Natural	How ventilated: Furnace	How ventilated: Fan—diam.
1	Adams, G. W.	J. W. Steele	120			1			1	10			1		1		
2	Bancroft, G. M.	DeWitt C. Woolery	140			1			2				1		1		
3	Boyd & Son, Thos.	Thos. Boyd & Son	115	1				20	3		1					1	
4	Christopher, J. H.	F. Millard	180		1				1	7			1		1		
5	Hardin, John	L. M. Herrington	60		1				2	6			1		1		
6	Hanna & Co., L. E.	L. E. Hanna & Co.	220	1				40	3	3	1				1		
7	Macknod, Isaac	D. A. Bullick	208			1			2	2			1		1		
8	Melley, M. B.	M. B. Melley	90		1				1	8			1		1		
9	Park, W. L.	E. T. Strickland	95			1			2	3			1		1		
			1,228	2	3	4					2		7		8	1	

COAL MINES—Continued.

COUNTY.

Long-wall	Pillar and room	Amount of powder used and cost of same.		Mules worked.		Employes.						Price paid for mining.		Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
		No. of kegs	Cost	Winter	Summer	Miners		Others.		Total.		Winter	Summer				
						Winter	Summer	Winter	Summer	Winter	Summer						
1						6	6	1	1	7	7	$1 25	$1 25	1,750	$1 65	$2,872	1
	1					5	5			5	5	1 25	1 25	1,350	2 00	2,700	2
1						8	4	2	1	10	5	1 43	1 43	585	2 32	1,356	3
2	1					19	15	3	2	22	17			3,685	$1 90	$6,928	

COUNTY.

1				4	3	90	50	25	18	115	68	$1 05	$1 05	20.000	$2 50	$50,000	1

COUNTY.

	1					4				4		$1 00	$ 87	600	$1 25	$750	1
	1	8	$16 00			3	4	2		5	4	1 00	1 00	630	1 25	787	2
	1	22	44 00			2		1		3		1 00	1 00	460	1 25	575	3
	1					4	4			4	4	1 00	1 00	1,440	1 25	1,800	4
	1					2				2		1 00	75	200	1 25	250	5
	1					8	4	3	3	11	7	60	50	3,150	1 25	3,937	6
	1					6	6			6	6	1 00	1 00	2,315	2 25	5,208	7
	1					4				4		1 25	1 25	495	1 75	866	8
	1	1	2 25			3				3		1 00	1 00	405	2 00	810	9
	9	31	$62 25			36	18	6	3	42	21			9,695	$1 53	$14,983	

STATISTICS OF
LAFAYETTE

Office number.	Name of company or mine owner.	Name of operator.	No. days worked.	Kind of opening				Depth of shaft.	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft.	Slope.	Drift.	Strip-pit.		Feet.	Inches.	Steam.	Horse.	Hand.	Electricity.	Natural.	Furnace.	Fan—diam.
1	Anderson, August	August Anderson	300	..	..	1	..	....	1	4	..	1	..	..	..	1	..
2	Bell, W. H	W. H. Bell	150	..	..	1	..	....	1	8	..	..	1	..	1	..	..
3	Bell & Greer	Bell & Greer	200	..	..	1	..	..	1	8	..	..	1	..	..	1	..
4	Bonanza Coal Co	S. W. Brandau	200	1	..	..	..	71	1	8	..	1	..	..	..	1	..
5	Buckhorn Coal Co	S. Mc. R. Calloway	85	1	..	..	..	118	4	4	1	..	..	..	..	..	10
6	Carter Coal Co	Carter Coal Co	220	..	..	1	..	....	1	7	..	..	1	..	..	1	
7	Chancelor, C. A	C. A. Chancelor	210	..	..	..	1	..	1	8	..	..	1	..	..	1	..
8	Consolidat'd Farmers' C.C.	Con. Farmers' Coal Co.	190	3	1	1		75 30 20	1	6	2	1	2	..	..	3	10 10
9	Corder Coal Co	H. G. Asbury	105	1	..	..	..	75	1	9	1	..	..	..	..	..	6
10	Diamond Coal Co	C. S. Wilson, Mgr	158	1	..	..	..	56	1	10	..	1	..	..	..	1	.
11	Dover Coal Co	Dover Coal Co	200	..	..	1	..	..	2	..	..	..	1	..	..	1	..
12	Edmunds, J. A	J. A. Edmunds	160	1		..	..	40	2	..	1	..	..	..	..	1	..
13	Farmers' Coal Co	G. B. Beatty, M. Nos. 2&3	273	1	..	..	..	45	1	6	1	1			..	..	8
14	Feith, Wm.	Kratz & Grim	95	..	1		..	....	1	6	..	1	..	..	1	..	..
15	Frerking, H. F	H, F. Frerking	160	..	1	..		....	1	6	..	..	1	..	..	1	
16	Gann, R. B	R. Y. Rowland	20	..	..	1	..	....	1	..	..	..	1	..	1	..	..
17	Gaffin, O. M	O. M. Gaffin	282	..	..	1	..	....	1	6	1	..	..	..	..	1	..
18	Geisendorfer, S. F	S. F. Giesendorfer	280	..	..	1	..	....	1	8	..	1	..	..	1	..	..
19	Hendricks, S. B., Miss	M. Bartels	200	..	..	1	..	....	1	10	..	..	1	..	1	..	
20	Hendricks, S., Mrs	H. Bartels	225	..	1	..	..	....	1	8	..	..	1	..	1	..	..
21	Hoffman, E. J	E. J. Hoffman	121	..	1	..		....	1	6	1	..	..	..	1	..	..
22	Hohenwald Bros	C. R. Hohenwald	239	1		..	..	30	1	10	1	..	..	..	..	1	..
23	Hudson, Jas.	James Hudson	120	1	..	..	..	30	1	8	1	..	..	..	1		..
24	Independence Coal M. Co.	L. B Zeitz	175	1	..	..	..	46	1	6	1	..	..	..	..	..	5
25	Jones, Emma, Mrs	W. Alcorn	60	..	1	..	..	....	1	5	..	1	..	..	..	1	..
26	Kreese, A. F.	A. F. Kreese	135	..	1	..	..	....	2	2	..	1	..	..	1	..	..
27	Labor Ex. Coal M. Ass'n	Labor Ex. C. M. Ass'n	220	1	..	..	..	105	1	6	1	..	..	..	..	1	..
28	Lexington Coal Co	Lex. C. M. Co. G. O. Shaft	254	1	..	..	..	43	2	..	1	..	..	..	..		10 10
29	" "	" Graddy "	258	..	..	1	1	....	1	8	..	..	..	1	..	1	..
30	" "	" McDowell "	51	1	..	..	..	43	1	10	1	..	..	..	..	..	10
31	" "	" Midway "	291	1	..	..	..	138	1	10	..	..	..	1	..	..	12
32	" "	" No. 1 Riverton "	72	..	..	1	..	....	1	10	..	..	1	..	..	1	..
33	" "	" Seawell "	221	..	..	1	..	....	1	8	..	..	1	..	..	1	..
34	" "	" Valley "	291	1	..	..	..	87	1	10	..	..	..	1	..	..	12
35	Langest, J. R	J. S. Stephenson	280	..	..	1	..	....	1	6	..	..	1	..	..	1	..
36	Looney Mine	Ballew & Gladish	224	1	..	..	..	80	1	6	1	..	..	..	..	..	8
37	McGrew, J. C	J. C. McGrew	176	..	..	1	..	....	1	10	..	..	..	1	..	1	..
38	Macey, Estate Henry	Henry Macey Estate	168		..	1		....	1	8	..	..	1	..	..	1	..
39	Mayview Coal Co	B. F. Cary	216	1	..	-	..	135	1	8	1		..	..	..	1	..
40	Morgan, W. P	W. P. Morgan	250	..	..	1	..	....	1	8	..	..	1		1	..	..
41	Morrison & Wentworth Bk	Star Coal Co	207	..	..	1	..	...	1	6	..	1	..	..	..	1	..
42	Perry Thos.	Thos. Perry	120	..	..	1	..	....	1	4	..	..	1	..	1	..	..
43	Rosewell Bros. Jas	Jas. Rosewell & Bro	252	1	..	..	..	75	2	..	..	1	..	..	..	1	..
44	Salt Fork, Coal Co	Salt Fork C. & M. Co	149	1	..	..	..	45	1	6	..	1	..	..	..	..	7
45	Silver Creek Coal Co	Jones & Mitchell	255	1	..	..	..	127	4	..	1	..	..	..	..	..	6
46	Strothers, F. T	F. T. Strothers	20	.	1	..	..	....	1	3	..	..	1	..	1	..	..
47	Summers, M. W	M. W. Summers	225	..	..	1	..	....	2	..	..	..	1	..	1	..	..
48	Walton Mines	J. T. Walton	220	..	1	..	..	....	1	6	..	..	1	..	..	1	..
49	Walton J. F	Seth Spruce	125	..	1	..	..	....	1	6	..	..	1	..	1	..	
50	Wellington Coal Co	Lab. Ex. Branch No. 330.	183	1	..	..	..	45	1	6	..	1	..	..	..	1	
51	Williamson, C. T	Shackleford & Borland.	30	..	..	1	..	....	1	..	..	..	1	..	1	..	..
52	Woskoski, M	Mike Woskoski	245	1	..	..	..	....	1	6	..	..	1	..	..	1	..
53	Serat, M. E	M. E. Serat	290	1	..	..	..	112	1	10	1	..	..	..	..	..	12
			9,996	25	10	21	2	....	..	..	18	13	23	4	15	26	17

COAL MINES—Continued.

COUNTY.

Pillar and room	Long-wall	Amount of powder used and cost of same. No. of kegs	Amount of powder used and cost of same. Cost	Mules worked. Winter	Mules worked. Summer	Employes. Miners. Winter	Employes. Miners. Summer	Employes. Others. Winter	Employes. Others. Summer	Employes. Total. Winter	Employes. Total. Summer	Price paid for mining. Winter	Price paid for mining. Summer	Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
1						4	4			4	4	$1 17	$1 17	930	$1 75	$1,627	1
1						5		1		6		1 12		700	1 75	1,125	2
1						8	4			8	4	1 18	1 06	1,700	1 75	2,975	3
1						40	10	10	2	50	12	1 05	1 05	7,000	1 85	12,950	4
	1	70	$140 00			17		5		22		70		1,487	1 50	2,230	5
1						50	50	5	2	55	52	1 25	1 25	13,125	1 68	22,050	6
1				1	1	11	7			11	7	1 18	1 18	1,815	2 00	3,630	7
5				8	4	150	75	20	10	170	85	1 00	1 00	25,200	2 00	50,400	8
1				2	2	24	24	9	7	33	31	1 00	1 00	3.623	1 76	6,386	9
1				2	2	40	30	10	9	50	39	1 00	1 00	14,280	1 78	25,497	10
	1			3	2	50	30	3	3	53	33	1 17	1 17	6,000	1 60	9,600	11
	1					9	6	3	2	12	8	1 15	1 15	1,547	1 40 1 60	2,475	12
	1			7	2	60	10	30	2	90	12	1 00	1 00	21,010	1 87	38,812	13
	1					3				3		1 00	1 00	399	1 75	682	14
	1					2	2			2	2			336	1 62	546	15
1						6				6		1 25	1 25	120	1 75	210	16
1				2	1	35	12	4	3	39	15	1 03	1 05	11,438	1 65	18,864	17
1						4	2			4	2	1 12	1 12	1,145	1 50	1,732	18
1						4	3	1	1	5	4	1 25	1 25	500	1 75	875	19
1						3	2			3	2	1 10	1 10	675	1 50	1,012	20
1						2	2			2	2	1 12	1 12	360	1 56	563	21
1						5	4	1		6	4	1 12	1 12	1,590	1 68	2,679	22
1						3				3				500	1 87	1.050	23
1				1	1	20	10	3	2	23	12	1 10	1 10	3,675	1 45	5,329	24
1						3				3		1 25	1 25	172	1 75	301	25
1						5	2			5	2	1 25	1 25	800	2 00	1.600	26
1						55	40	4	3	59	43	1 17	1 17	15,463	1 60	24,576	27
1				9	8	138	116	23	21	161	137	1 05	93	73.974	1 44	106,517	28
2				9	8	72	60	50	41	122	101	63	56	49,330	1 56	77,094	29
1				4	2	57	30	12	8	69	38	1 06	93	5,704	1 42	8,141	30
1				2		45	35	29	20	74	55	1 06	1 06	19,363	1 48	28,691	31
1				4	2	50	34	12	10	62	44	1 06	1 06	7.259	1 45	10.558	32
1				4	3	51	35	7	5	58	40	1 06	1 06	15,873	1 44	22 958	33
1				2		47	38	28	9	75	47	1 06	1 06	29,099	1 52	44,291	34
1						6	6	1	1	7	7			2,200	2 00	4,400	35
1				2	2	40	20	6	3	46	23	1 00	1 00	8,000	1 50	12,000	36
1				3		225		15		240		1 05		29,799	1 81	53,897	37
1				5		42		9		51		1 00	1 00	7.607	1 60	12,210	38
1						12	12	3	3	15	15	1 00	1 00	4,000	1 90	7,600	39
1						2	2			2	2	1 00	1 00	657	1 75	1,150	40
1						33	14	3	2	36	16	1 17	1 17	8,887	1 70	15,107	41
1						2	2			2	2	1 25	1 25	410	2 00	820	42
1						4	4			4	4	1 25	1 25	1,512	1 75	2,646	43
1				3	3	45	36	12	10	57	46	1 00	1 00	13,280	1 72	22,900	44
1				1	1	10	4	2	1	12	5	70	70	3,080	1 10	3,388	45
1						2				2		1 25		60	2 00	120	46
1						4	2			4	2	1 12	1 00	1,350	1 75	2,362	47
1						8	6	1	1	9	7	1 20	1 20	2,840	1 75	4,970	48
1						1				1		1 20	1 20	125	1 75	219	49
1				2	1	12	6	3	2	15	8	1 07	1 07	3.155	1 70	5,365	50
1						2				2		1 20		80	1 75	140	51
1						2	2			2	2	1 00	1 00	625	1 75	1,093	52
1				3	1	40	20	10	5	50	25	1 05	1 05	15,293	1 40	21.376	53
52	6	70	$140 00	79	46	1570	813	335	188	1905	1001			439.217	$1 62	$709,849	

STATISTICS OF

LINN

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Kind of opening				Depth of shaft	Thickness of coal		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Black Plume Mine	W. N. Nickell	215	1	..	..	..	150	2	02	..	1	..	..	1	..	..
2	Brookfield Coal Co	Brookfield Coal Co	205	1	..	..	..	155	2	04	1	..	..	..	..	1	..
3	Burdett Mine	Burdett & Johnson	211	1	..	..	..	140	2	03	..	1	..	..	1	..	..
4	Landreth	Landreth & Sons	223	1	..	..	..	130	2	02	..	1	..	..	1	..	..
5	Marceline Coal Co.	Marceline Coal Co	261	1	..	..	..	185	2	04	1	..	..	..	..	..	12
6	Schaefer, Bernard	Bernard Schaefer	213	1	..	..	..	150	2	02	1	..	..	..	..	1	..
7	Williamson, L. R	L. R. Williamson	240	1	..	..	..	155	2	00	..	1	..	..	..	1	..
			1,568	7	..	..	..	....	..	..	3	4	..	..	3	3	1

LIVINGSTON

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Adams, J. A	J. A. Adams	65	1	..	..	..	70	1	06	..	1	..	..	1	..	..
2	Cox's Star Mine	W. L. Cox & Bro	95	1	..	..	..	55	1	06	..	1	..	..	..	1	..
3	Gorlich, C	J. W. Tindell	119	..	..	1	..	....	1	04	..	..	1	..	..	1	..
			279	2	..	1	..	....	..	..	..	2	1	..	1	2	..

MACON

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Bevier Black Diamond	Bevier Black Diamond	208	1	..	..	..	140	4	..	1	..	..	..	..	..	14
2	Helmet Mining Co.	Helmet Mining Co.	277	1	..	..	..	135	3	8	1	..	..	..	..	1	12
3	James, Levi Mrs	James Bros	250	1	..	..	..	50	4	6	..	1	..	..	..	1	..
4	Kansas & Texas Coal Co	K. & T. C. Co., Mine No. 52	65	..	1	..	..	...	4	6	1	..	..	..	..	1	..
5	" " "	" " " No. 57	243	..	1	..	..	....	4	..	..	1	..	..	..	1	..
6	" " "	" " " No. 61	275	1	..	..	..	126	4	..	1 1	..	..	..	..	..	12
7	" " "	" " " No. 66	283	1	1	..	..	50	4	6	1	..	..	..	..	..	12
8	" " "	" " " No. 68	66	..	1	..	..	....	4	..	..	1	..	..	..	1	..
9	" " "	" " " No. 69	236	..	..	1	..	....	4	..	..	1	..	..	..	1	..
10	" " "	" " " No. 70	254	..	..	1	..	....	3	6	..	1	..	..	..	1	..
11	Murlin Coal Co	Murlin Coal Co	240	1	..	..	..	145	4	..	1	..	..	..	..	..	12
12	Northwestern C. & M. Co.							65			1						10
		Northwest'n C. & M. Co.	204	2	..	..	..	140	4	..	1	..	..	..	..	..	10
13	Richmond, J. G.	J. G. Richmond	40	..	..	1	..	...	5	..	..	..	1	..	1	..	..
14	Thomas Rowland	Rowland, Thomas.	255	1	..	..	..	130	4	..	..	1	..	..	..	1	..
15	Watson Coal Co	W. S. Watson	241	1	..	..	..	90	4	..	1	..	..	..	..	..	12
			3,137	10	4	3	..	....	..	..	10	6	1	..	1	8	8

MONITEAU

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Bowlen-Rohrback M. Co.	Bowlen-Rohrback M. Co.	40	1	..	..	..	60	18	..	..	1	..	..	..	1	..

MONROE

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Grier, W. T.	Grier & Pool	125	..	..	1	..	...	1	6	..	..	1	..	1	..	..
2	Montgomery, W. J.	W. J. Montgomery	270	..	..	1	..	....	1	8	..	..	1	..	1	..	..
			395	..	..	2	..	....	..	..	..	..	2	..	2	..	..

MORGAN

Office number	Name of company or mine owner.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Hubbard & Moore	Hubbard & Moore	180	..	..	1	..	...	60	..	1	..	..	..	1	..	..

COAL MINES—Continued.

COUNTY.

Long-wall	Pillar and room	Amount of powder used and cost of same.		Mules worked.		Employes.						Price paid for mining.		Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
						Miners		Others.		Total.							
		No. of kegs.	Cost	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer				
1	..	....	....	..	..	9	2	1	1	10	3	$1 25	$1 25	2,365	$2 00	$4,730	1
1	..	....	....	..	..	18	6	6	4	24	10	1 12	1 12	3,920	2 00	7,840	2
1	..	....	....	..	..	8	2	1	1	9	3	1 25	1 25	1,362	2 00	2,724	3
1	..	....	....	..	..	14	3	1	....	15	3	1 25	1 25	2,123	1 85	4,925	4
1	..	....	....	..	11	161	161	31	31	192	192	1 05	1 05	70,967	1 53	107,910	5
1	..	....	....	..	..	16	6	2	1	18	7	1 25	1 25	3,122	2 24	7,000	6
1	..	....	....	..	..	8	2	2	2	10	4	1 25	1 25	1,600	2 12	3,400	7
7	..	....	....	..	11	234	182	44	40	278	222	....	....	85,459	$1 62	$138,529	

COUNTY.

Long-wall	Pillar and room	No. of kegs.	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	....	....	..	..	2	....	1	....	3	....	$1 00	$1 00	160	$2 00	$320	1
..	1	....	....	..	..	5	2	1	1	6	3	1 00	1 00	595	2 50	1,487	2
1	..	....	....	..	..	3	....	....	....	3	....	1 50	1 00	422	2 00	844	3
1	2	....	....	..	..	10	2	2	1	12	3	....	....	1,177	$2 25	$2,651	

COUNTY.

Long-wall	Pillar and room	No. of kegs.	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
.	1	1,216	$2,432 00	20	20	69	48	18	18	87	66	$ 60	$ 60	41,608	$1 12	$46,809	1
1	..	796	1,592 00	6	6	95	100	32	33	127	133	75	72	56,207	1 12	63,233	2
.	1	40	80 00	..	..	6	3	1	1	7	4	85	85	2,340	1 50	3,510	3
..	1	190	380 00	..	..	21	....	16	....	37	....	60	60	3,836	91	3,490	4
.	1	3,581	7,162 00	..	..	96	111	31	55	127	166	60	60	82,186	94	76,511	5
..	1	7,128	14,256 00	..	..	260	250	181	227	441	477	60	60	199,813	1 00	199,637	6
	1																
..	1	5,158	10,316 00	..	..	173	174	70	71	243	245	60	60	148,552	1 00	149,174	7
..	1	288	576 00	..	..	27	....	12	....	39	....	60	60	6,004	92	5,524	8
..	1	1,411	2,822 00	..	..	36	34	10	12	46	46	60	60	24,554	95	23,383	9
..	1	6,044	12,088 00	..	..	135	156	32	41	167	197	60	60	122,887	94	114,853	10
.	1	2,300	4,600 00	8	8	175	175	40	40	215	215	60	60	89,000	1 05	93,450	11
	1																
..	1	5,212	10,424 00	30	20	400	390	60	60	460	450	60	60	177,018	1 11	196,619	12
..	1	3	6 00	..	..	2	....	....	....	2	.	60	60	120	1 25	150	13
..	1	45	90 00	..	..	2	2	...	...	2	2	85	85	996	1 50	1,492	14
..	1	2,500	5,000 00	12	12	83	83	18	18	101	101	60	60	70,122	92	64,512	15
1	16	35,912	$71,824 00	76	66	1580	1526	521	576	2101	2102	....	....	1,025,213	$1 01	$1,042,327	

COUNTY.

Long-wall	Pillar and room	No. of kegs.	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	....	....	1	..	4	....	....	....	4	....	$1 10	....	480	$1 50	$720	1

COUNTY.

Long-wall	Pillar and room	No. of kegs.	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
1	..	....	....	..	..	3	1	....	....	3	1	$ 85	$ 85	500	$1 25	$625	1
1	..	4	$11 00	..	..	3	3	....	....	3	3	1 00	87	945	1 25	1,111	2
2		4	11 00			6	4			6	4			1,445	1 20	$1,736	

COUNTY.

Long-wall	Pillar and room	No. of kegs.	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	40	$80 00	..	..	4	4	....	...	4	4	$ 50	$ 50	1,674	$1 50	$2,511	1

STATISTICS OF

MONTGOMERY

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Kind of opening				Depth of shaft	Thickness of coal		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam
1	Hayes, F.	Hays Bros. & Johnson	82	1	..	..	..	24	2	8	..	1	..	..	1	..	..
2	Whitehead, Henry	Henry Whitehead	100	1	..	..	..	30	2	6	..	1	..	..	1	..	..
			182	2								2			2		

NODAWAY

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam
1	Carpenter, Wroe	J. O. Pearson	180	1	..	..	..	72	1	..	..	1	..	..	..	1	..
2	Potts, Wm.	W. Potts	160	1	..	..	..	20	1	..	..	1	..	..	..	1	..
3	Slaughter, J, Mary	J. S. Davis	160	1	..	..	..	40	1	4	..	1	..	..	1	..	..
			500	3	..	..	..	....	..	..	..	3	..	..	1	2	..

PUTNAM

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam
1	Blackbird Coal Co.	Blackbird Coal Co.	181	1	..	..	..	35	2	09	1	..	..	..	..	1	..
2	Blankensphip, Thos.	Smith & Whitaker,	156	..	..	1	..	....	3	00	..	..	1	..	1	..	..
3	Dixon, Hugh	Hugh Dixon	100	..	..	1	..	....	2	08	..	..	1	..	1	..	..
4	Dodge, C. E.	C. E. Dodge	190	1	..	..	..	110	3	00	1	..	..	..	..	..	10
5	Fielding & Son, Thos.	Star Coal Co.	180	..	1	..	..	....	2	10	..	1	..	..	..	1	..
6	Guffey, Alex.	Alex. Guffey	112	..	..	1	..	....	3	00	..	..	1	..	1	..	..
7	Lynch, Thos.	Thos. Lynch	105	..	..	1	..	....	3	04	..	..	1	..	1	..	..
8	Mendota Coal Co.	Mendota C. Co., M. 2&8.	245	1	1	..	..	67	2	10	1	1	..	..	..	1	12
9	" "	Arnold Bros., Mine 9	50	..	..	1	..	....	2	10	..	1	..	..	..	1	..
10	" "	H. Medlin, Mine 7.	75	..	..	1	..	....	3	00	..	..	1	..	..	1	..
11	Minear, David	David Minear	120	..	..	1	..	....	3	04	..	..	1	..	1	..	..
12	Piercy, G. B.	Smith & Lynch	10	..	..	1	..	....	3	02	..	..	1	..	1	..	..
13	Robison, Jake	Jake Robison	165	..	..	1	..	....	2	06	..	..	1	..	1	..	..
14	Rogers, J. W.	Rogers Bros	120	..	1	..	..	....	3	00	..	1	..	..	..	1	..
15	Shean, Dan	Dan Shean	40	..	1	..	..	....	2	08	..	1	..	..	1	..	..
16	Trent, Wilson	Wilson Trent	10	..	..	1	..	..	3	00	..	..	1	..	1	..	..
			1,859	3	4	10	..	....			3	5	9		9	6	2

RALLS

Office number	Name of company or mine owner.	Name of operator.	No. of days worked.	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam
1	Barger, J. A.	J. A. Barger	120	..	1	..	..	....	2	08	..	..	1	..	1	..	..
2	Fitzpatrick Bros.	Fitzpatrick Bros.	238	1	..	..	..	62	2	08	..	1	..	..	..	1	..
3	Perry Coal Co.	Perry Coal Co.	130	1	..	..	..	68	2	08	..	1	..	..	..	1	..
		Mine, No. 1.	......	1	..	..	..	45	..	..	..	1	..	..	..	..	..
4	Ralls County Coal Co.	Ralls Co. Coal Co., M. 2	229	1	..	..	..	43	2	04	..	1	..	..	..	2	..
													1	..	1	..	..
5	Salling Coal Co.	Salling Coal Co.	105	..	..	1	1	....	2	02	..	..	1	..	1	..	..
			822	4	1	1	1	....	..	..	..	4	3	..	3	4	..

COAL MINES—Continued.

COUNTY.

Long-wall	Pillar and room	Amount of powder used and cost of same.		Mules worked.		Employes. Miners.		Others.		Total.		Price paid for mining.		Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
		No. of kegs	Cost	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer				
1	.	3	$6 00			6	1	....	1	6	2	$1 00	$1 00	1,080	$1 75	$1,890	1
1	..	4	8 00			4	....	....	....	4	....	1 00	1 00	600	1 50	900	2
2	..	7	$14 00	..	..	10	1	....	1	10	2	....	....	1,680	$1 69	$2,790	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
1	.	....	....	..	..	3	2	1	....	4	2	$1 50	$1 25	600	$2 50	$1,500	1
1	..	....	....	..	..	2	2	....	....	2	2	2 00	2 00	500	2 50	1,250	2
1	..	....	....	..	..	8	2	2	2	10	4	1 75	1 75	900	2 50	2,250	3
3	..	....	....	..	..	13	6	3	2	16	8	....	....	2,000	2 50	5,000	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	....	....	..	..	40	30	10	7	50	37	$ 95	$ 95	9,343	$1 60	$17,618	1
..	1	....	....	..	..	4	4	....	....	4	4	75	75	2,000	1 25	2,500	2
..	1	....	....	..	..	3	....	....	....	3	....	75	....	500	1 25	625	3
1	..	....	....	..	..	20	15	5	5	25	20	83	83	8,000	1 60	12,800	4
..	1	....	....	1	1	12	4	4	2	16	6	83	83	1,812	1 45	2,631	5
..	1	....	....	..	..	3	....	....	....	3	....	85	85	900	1 25	1,125	6
..	1	....	....	..	..	2	....	....	....	2	....	75	75	220	87	192	7
1	1	....	....	20	20	271	241	60	60	331	301	83	83	102,408	1 32	135,995	8
..	1	....	....	1	1	18	10	3	2	21	12	83	83	1,800	1 38	2,484	9
..	1	....	....	..	..	35	....	4	....	39	....	83	....	5,150	1 30	6,695	10
..	1	....	....	..	..	6	....	....	....	6	....	87	87	1,280	1 00	1,280	11
..	1	....	....	..	..	4	....	....	....	4	....	75	75	48	1 00	48	12
..	1	....	....	..	..	2	....	....	....	2	....	75	75	500	1 00	500	13
..	1	....	....	1	1	15	12	3	3	18	15	84	84	5,215	1 50	7,822	14
1	..	....	....	1	..	3	....	....	....	3	....	85	85	200	1 00	200	15
..	1	....	....	..	..	1	....	....	....	1	....	....	....	20	75	15	16
3	14	....	....	24	23	439	316	89	79	528	395	....	....	139,456	$1 39	$192,530	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
1	..	....	....	..	..	6	1	....	....	6	1	$ 91	$ 91	1,750	$1 37	$2,406	1
1	..	....	....	..	..	16	10	3	2	19	12	91	91	5,250	1 25	6,562	2
1	..	....	....	..	..	12	9	2	2	14	11	91	91	2,938	1 25	3,672	3
1 1	..	....	....	2	2	34	34	5	5	39	39	91	91	15,000	1 20	18,000	4
1 1	..	7	$14 00	..	..	2	....	2	....	4	....	1 00	1 00	300	1 25	375	5
7	..	7	$14 00	2	2	70	54	12	9	82	63	....	....	25,238	$1 22	$31,015	

STATISTICS OF

RANDOLPH

Office number	Name of company or mine owner.	Name of operator.	No. days worked	Kind of opening				Depth of shaft	Thickness of coal		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan-diam.
1	Beckington, Jane Mrs.	Boone & Graves	260			1			4	0		1			1		
2	Brown & Wellsley	Brown & Wellesly	205	1				75	3	8		1				1	
3	Cooper & Stockhouse	A. B. Cooper & Co.	240	1				125	3	6	1					1	
4	Edwards, Emanuel	Emanuel Edwards	75			1			4	0			1		1		
5	Elliot Coal Co.	Elliott Coal Co. (Elliott)	260	1				145	4	0	1						12
6	" "	" " (Santiago)	214		1				4	0	1					1	
7	Enterprise Coal Co.	Jno. Cronan	250			1			3	10		1				1	
8	Higbee Coal Co	Higbee C. Co. Mine No. 1	270	1				175	3	8	1						10
9	" "	" " " " 2	220	1				123	3	8	1						14
10	Interstate Mining Co.	Walton Coal Co.	252	1				110	3	8	1						12
11	Lewis & Sons, J. J.	J. J. Lewis	187		1				3	10		1			1		
12	McKiernan, W. H.	W. H. McKiernan	120	1		1		50	4	0		1	1		1	1	
13	Mitchell W. E.	W. E. Mitchell.	230			1			4	0		1				1	
14	Morris Coal Co.	Morris C. Co. Mine No. 10	173	1				84	4	0	1						20 10
15	Murlin Coal Co.	Murlin Coal Co.	280	2	1			100	4	0	3					1	10
16	Robinson, J. F.	J. F. Robinson	230			1		88	4	0		1			1		
17	Ward, Harry	Harry Ward	150	1					3	10		1				1	
			3,615	11	3	6					10	8	2		5	8	7

RAY

Office number	Name of company or mine owner.	Name of operator.	No. days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan-diam.
1	Blair Andrew	Andrew Blair	150	1				50	2			1			1		
2	Bryant & Kline	S. G. S. Bean	105			1			1	6			1		1		
3	Campbell, Margaret	W. Sickers	109			1			2				1			1	
4	Chenault, A. and R.	A. R. Chenault	106	1				96	2	4		1				1	
5	Crespin, E. F. Mrs.	Crespin & Ward	218	1				80	2			1				1	
6	Fowler Coal & Mining Co.	Fowler C. & M. Co.	100	1				40	2	2		1			1		
7	Hubbell Coal Co.	Hubbell C. Co., Mine No. 10	180	1				110	2	4		1				1	
8	Hulett	Schooler & Thompson	120	1				85	1	11		1				1	
9	Huston, Jas.	Jos. Huston	104			1			1	7			1			1	
10	Kallenberger, J. J.	J. J. Kallenberger	130			1			2				1		1		
11	Kansas & Texas Coal Co.	Murlin C. Co., Mine No. 30	224	1				72	1	7	1						12
12	Loeven, Jos	Jos. Loeven	160			1			2				1		1		
13	Marshall & Johnston heirs	Jas. M. Edgar	150			1			1	6			1			1	
	Mine No. 7	Mine No. 7	248	1				100			1						10
14	Merc'tile C. Co., Mine No. 17	Mercantile C. Co., Mine No. 17	163	1				193	2	4	1						10
15	Murry, Jessie	J. Kraft & Sons	70	1				60				1				1	
16	Pence Bros. & Calnen	Pence Bros. & Calnen	200	1				90	2		1						8
17	Pence, Hughes & Gibson	Pence & Co.	150	1				40	1	6	1					1	
18	Peckering, Jos.	Peckering Coal Co.	225	1				107	2		1					1	
19	Rankin, W. D.	A. F. Rankin	165			1			2			1				1	
		Mines 4, 5, 9, 12 and 14. Camden 1 and 2						50									10 12
20	Richmond & Camden C. Co.	Richmond & Camden C. Co.	160	7				120	2		6	1				3	10 10
21	Sevier, Chas.	Ottman & Swope	210		1				2	2			1			1	
22	Starr, Alex.	Frank Hemmer	105			1			1	8			1			1	
23	The Grimes Mine	Hugh Blair	100	1				190	2	6			1				4
24	Washington, A. L.	S. H. Washington	176	1				100	2	4		1				1	
25	Wilson, Mary Mrs.	Wilson Coal Co.	190	1				110	2	4	1					1	
			4,018	23	1	8					13	10	9		5	18	9

COAL MINES—Continued.

COUNTY.

Pillar and room.	Long-wall.	Amount of powder used and cost of same. No. of kegs.	Cost.	Mules worked. Winter.	Mules worked. Summer.	Employes. Miners. Winter.	Miners. Summer.	Others. Winter.	Others. Summer.	Total. Winter.	Total. Summer.	Price paid for mining. Winter.	Price paid for mining. Summer.	Tons of coal mined.	Price received at mines per ton.	Amount received for product.	Office number.
1		12	$24 00	..	..	5	3	1	1	6	4	$ 70	$ 70	3,211	$1 00	$3,211	1
1		60	120 00	..	..	3	2	....	....	3	2	85	85	1,300	1 25	1,625	2
1		420	840 00	3	3	20	20	3	3	23	23	60	60	10,800	1 10	11,880	3
1		3	5 25	..	..	1	....	....	....	1	....	1 00	1 00	68	1 50	102	4
1		....	....	8	8	80	70	29	20	109	90	85	85	48,913	1 30	61,319	5
1		1,405	2,810 00	4	4	70	60	20	20	90	80	60	60	32,195	1 02	32,709	6
1		175	350 00	1	1	6	6	2	2	8	8	80	80	2,885	1 12	3,245	7
1		150	300 00	..	..	122	95	36	28	158	123	85	85	53,553	1 25	66,941	8
1		800	1,600 00	.	.	36	36	12	12	48	48	60	60	25,179	1 25	31,723	9
1		....	....	..	..	112	86	30	24	142	110	80	....	49,034	1 25	61,292	10
1		80	160 00	1	1	13	....	....	....	13	....	1 10	1 10	2,571	1 27	3,282	11
2		120	240 00	..	..	7	4	1	1	8	5	65	65	2,325	1 10	2,558	12
1		120	240 00	1	1	10	4	3	1	13	5	60	60	3,926	1 25	4,907	13
1		3,600	7,200 00	10	5	150	130	35	30	185	160	60	60	94,513	1 02	96,410	14
3		3,200	6,400 00	7	7	125	125	30	30	155	155	60	60	95,000	1 00	95,000	15
1		[illegible]	70 00	1	1	2	2	1	1	3	3	60	60	1,440	1 25	1,800	16
1		18	36 00	1	1	5	5	1	1	6	4	75	75	1,711	1 00	1,711	17
5	16	10,203	20,395 25	37	32	787	646	204	174	971	820	....	....	432,655	$1 11	$480,745	

COUNTY.

Pillar and room.	Long-wall.	Amount of powder used and cost of same. No. of kegs.	Cost.	Mules worked. Winter.	Mules worked. Summer.	Employes. Miners. Winter.	Miners. Summer.	Others. Winter.	Others. Summer.	Total. Winter.	Total. Summer.	Price paid for mining. Winter.	Price paid for mining. Summer.	Tons of coal mined.	Price received at mines per ton.	Amount received for product.	Office number.
1		....	....	..	..	2	....	1	....	3	....	$1 00	$1 00	769	$1 75	$966	1
1		....	....	..	..	5	....	....	....	5	....	1 00	1 00	500	2 00	1,000	2
1		....	....	..	..	3	1	....	....	3	1	1 12	1 12	679	2 00	1,358	3
1		....	....	..	..	4	2	1	1	5	3	95	95	800	1 75	1,400	4
1		....	....	..	..	10	4	3	1	13	5	95	95	2,600	1 65	4,290	5
1		....	....	..	..	30	15	3	2	33	17	1 00	1 00	4,400	1 50	6,600	6
1		....	....	2	2	50	40	7	6	57	46	95	95	17,844	1 60	28,551	7
1		....	....	..	..	7	....	2	....	9	....	1 00	1 00	12,046	2 00	24,092	8
1		....	....	..	..	5	....	....	....	5	....	1 27	1 27	643	2 00	1,286	9
1		....	....	..	..	2	2	....	....	2	2	1 35	1 50	400	2 00	800	10
1		....	....	5	5	100	100	25	25	125	125	1 00	1 12	42,318	1 30	55,013	11
1		....	....	..	..	5	3	....	....	5	3	1 50	1 50	1,290	2 00	2,580	12
1		....	....	..	..	5	2	....	....	5	2	1 37	1 37	800	1 73	1,385	13
1		....	....	3	3	100	100	15	15	115	115	1 00	1 00	35,258	1 44	50,795	14
1		....	....	..	..	4	....	1	1	5	1	1 00	1 00	427	1 75	748	15
1		....	....	5	2	100	40	25	10	125	50	1 00	1 00	30,050	1 55	46,577	16
1		....	....	2	..	50	....	8	1	58	1	1 00	1 00	5,420	1 56	8,455	17
1		....	....	2	..	45	15	12	6	57	21	1 00	1 00	14,063	1 55	21,801	18
1		....	....	2	2	20	20	5	5	25	25	1 00	1 00	6,000	1 60	9,600	19
7		....	....	14	10	280	190	52	36	332	226	1 00	95	75,000	1 56	[illegible]	20
1		....	....	..	..	5	2	1	....	7	1	1 00	90	1,684	1 60	2,694	21
1		....	....	..	..	2	2	....	....	2	2	1 25	1 25	200	2 00	400	22
1		....	....	..	..	6	....	1	....	6	1	1 00	1 00	840	1 75	1,470	23
1		....	....	..	..	8	6	3	2	11	8	1 00	1 00	1,424	1 75	2,492	24
1		....	....	3	2	50	30	7	7	57	37	1 00	95	8,162	1 54	12,569	25
31		....	....	38	25	896	574	172	118	1068	692	....	....	261,909	$1 59	$405,708	.....

STATISTICS OF

SALINE

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Kind of opening				Depth of shaft	Thickness of coal.		Kind of power.				How ventilated.		
				Shaft	Slope	Drift	Strip-pit		Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Banks, Ira O.	Ira O. Banks	60	1	..	..	..	30	1	8	..	1	..	..	1	..	..
2	Terrell, Henry	T. S. Maupin	150	..	1	..	..	....	1	6	..	..	1	..	1	..	..
3	Terrell, H. C.	Tim Maupin	40	..	1	..	..	....	1	6	..	..	1	..	1	..	..
			250	1	2	..	..	....	..	..	..	1	2	..	3	..	..

ST. CLAIR

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Cook, Jas.	Jas. Cook.	30	..	..	..	1	....	1	6	..	1	..	..	1	..	..
2	Crowell, H. C.	O. S. Butcher	50	..	1	..	..	....	1	6	..	..	1	..	1	..	
3	Greggs, L. L	L. L. Griggs	90	..	1	..	..	....	1	10	..	..	1	..	1	..	..
4	Hoover Mines	Thos. Greathouse	120	..	1	..	..	....	3	4	..	..	1	..	1	..	..
5	" "	C. F. Seymour	144	1	..	..	..	60	2	8	..	1	..	..	1	..	..
6	Kneirim, John	Geo. H. Kneirim	74	1	..	..	..	26	2	6	..	1	..	..	1	..	..
7	Oliver, Alex	W. F. St. Clair	100	..	..	..	1	....	2	2	..	1	..	..	1	..	..
8	Short estate	J. M. Short	42	..	..	1	..	....	3	..	..	..	1	..	1	..	..
9	Sholz, J.	W. H. Lane	100	..	..	..	1	....	2	..	..	..	1	..	1	..	..
10	Woodin, H. M.	H. M. Woodin	50	..	..	1	..	....	3	..	..	..	1	..	1	..	..
			800	2	3	2	3	....	..	..	..	4	6	..	10	..	..

SCHUYLER

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Golston, Ira	Ira Golston	100	1	..	..	..	65	3	..	..	1	..	..	1	..	..
2	Kloke & Rosenthal	Bradburn & Co.	120	1	..	..	..	24	3	10	..	1	..	..	..	1	..
			220	2	..	..	..	....	..	..	..	2	..	..	1	1	..

VERNON

Office number	Name of company or mine owners.	Name of operator.	No. of days worked	Shaft	Slope	Drift	Strip-pit	Depth of shaft	Feet	Inches	Steam	Horse	Hand	Electricity	Natural	Furnace	Fan—diam.
1	Arthur Coal & Mining Co.	Arthur C. & M. Co.	120	..	1	..	..	....	4	10	..	1	..	..	..	1	
2	Augur, F. B. Hill Mine.	F. B. Augur.	50	..	1	..	..	....	2	6	..	1	..	..	1	..	..
3	Augur, F. B. Hubb Mine.	F. B. Augur.	30	1	..	..	..	....	2	6	..	1	..	..	1	..	..
4	Baker, Frank	Frank Baker.	80	..	..	1	..	....	2	..	..	1	..	..	1	..	..
5	Central C. & C. Co. M. No. 14	C. C. & C. Co. M. No. 14.	230	1	..	..	..	114	5	..	1	..	..	..	..	..	16
6	Central C. & C. Co. M. No. 19	C. C. & C. Co. M. No. 19.	259	1	..	..	..	95	4	6	1	..	..	..	..	..	12
7	Ewing, F. Y	Goodwin & Smith	90	..	..	..	1	....	1	8	..	1	..	..	1	..	..
8	Jones, P. W	D. K. Perkins	100	..	1	..	..	....	2	3	..	1	..	..	..	1	..
9	Lowes, J. A	J. A. Lowes	128	..	1	..	..	....	3	..	..	..	1	..	1	..	..
10	Mayberry, E. M	F. M. Mayberry	146	..	..	..	1	....	3	6	..	1	..	..	1	..	
11	Miller, J. F.	A. S. Brown	101	1	..	..	..	22	2	6	..	1	..	..	1	..	..
12	Radde, F. M.	F. M. Radde.	4	..	..	..	1	....	2	10	..	..	1	..	1	..	..
13	Rush Coal & Mining Co.	Rush Coal & Mining Co.	102	1	..	..	..	104	3	6	1	..	..	..	..	..	10
14	Vernon Coal Co.	J. A. Gee.	50	1	..	..	..	22	3	8	..	1	..	..	..	..	10
15	Whitworth, Chas.	Chas. Whitworth	105	1	..	..	..	25	2	6	..	1	..	..	..	1	..
			1,595	7	4	1	3	....			3	10	2	..	8	3	4

COAL MINES—Continued.

COUNTY.

Long-wall	Pillar and room	Amount of powder used and cost of same. No. of kegs	Cost	Mules worked. Winter	Mules worked. Summer	Employes. Miners. Winter	Employes. Miners. Summer	Employes. Others. Winter	Employes. Others. Summer	Employes. Total. Winter	Employes. Total. Summer	Price paid for mining. Winter	Price paid for mining. Summer	Tons of coal mined	Price received at mines per ton	Amount received for product	Office number
1	..	....	....	..	..	2	....	....	....	2	....	....	....	200	$1 12	$225	1
1	..	....	....	..	..	3	2	....	....	3	2	$1 50	$1 50	542	2 50	1,105	2
1	..	....	....	..	..	4	....	....	....	4	....	1 50	1 50	200	2 50	500	3
3	..	....	....	..	..	9	2	....	....	9	2	....	....	942	$1 94	$1,830	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
1	..	....	....	..	..	1	....	....	....	1	....	$1 12	....	20	$2 00	$40	1
..	1	....	....	..	..	4	....	....	....	4	....	1 12	....	40	1.75	70	2
..	1	....	....	..	..	4	2	2	....	6	2	1 12	$1 12	558	1 82	1,013	3
..	1	....	....	..	..	3	3	....	....	3	3	1 12	1 12	600	2 50	1,500	4
..	1	....	....	..	..	4	2	2	2	6	4	1 00	1 00	871	1 84	1,610	5
..	1	35	$70 00	..	..	5	....	2	....	7	....	1 00	....	746	1 50	1,119	6
..	1	4	6 00	..	..	2	1	2	1	4	2	....	....	1,084	1 50	1,626	7
..	1	2	4 00	..	..	....	2	....	....	....	2	75	75	170	1 50	255	8
..	1	3	6 00	..	..	2	....	....	....	2	....	1 00	....	250	1 50	375	9
..	1	10	20 00	..	..	2	....	....	....	2	....	75	75	200	1 50	300	10
1	9	54	$106 00	..	..	27	10	8	3	35	13	....	....	4,539	$1 74	$7,908	....

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
1	..	1	200		..	3	....	....	....	3	....	87	87	600	$1 50	$900	1
..	1	2	350	2	2	15	15	4	4	19	19	87	87	3,200	1 25	4,000	2
1	1	3	550	2	2	18	15	4	4	22	19	....	....	3,800	$1 30	$4,900	

COUNTY.

Long-wall	Pillar and room	No. of kegs	Cost	Mules Winter	Mules Summer	Miners Winter	Miners Summer	Others Winter	Others Summer	Total Winter	Total Summer	Price Winter	Price Summer	Tons of coal mined	Price per ton	Amount received	Office number
..	1	655	$1,310 00	3	3	30	28	8	7	38	35	55	$ 55	16,397	$1 07	$17,545	1
..	1	5	9 25	1	1	....	2	....	....	....	2	75	75	644	1 50	966	2
.	1	12	22 20	..	..	3	1	1	....	4	1	1 00	1 00	342	1 50	513	3
...	1	....	....	..	..	2	1	1	1	3	2	75	75	300	1 25	375	4
..	1	3,966	7,932 00	11	11	70	62	41	36	111	98	55	55	87,034	1 00	87,034	5
..	1	259	518 00	2	..	20	....	35	....	55	....	55	60	3,491	1 00	3,491	6
..	1	10	18 50	..	..	....	1	....	....	....	1	55	60	168	2 26	375	7
..	1	150	277 50	..	..	....	....	3	....	3	....	1 00	1 00	750	1 50	1,125	8
..	1	....	....	..	..	....	....	4	....	4	....	75	75	728	1 25	910	9
..	1	42	69 30	2	2	1	1	2	2	3	3	75	75	1,320	1 00	1,320	10
..	1	30	55 50	..	..	3	1	1	1	4	2	75	75	459	1 37	627	11
1	..	....	....	..	..	....	3	....	1	....	4	....	....	17	1 50	27	12
..	1	3,026	6,052 00	6	6	82	82	24	24	106	106	60	60	49,824	1 05	52,315	13
..	1	125	250 00	2	..	10	....	3	....	13	....	50 55	50 55	3,000	1 00	3,000	14
..	1	40	74 00	..	..	....	5	....	....	....	5	70	65	500	1 25	625	15
1	14	8,320	$16,588 25	27	23	221	187	123	72	344	259	....	....	164,972	$1 03	$170,246	....

TABLE IX—Showing rank of coal producing counties

No. counties.	Counties.	1891.		1892.		1893.		1894.	
		Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.
1	Bates	1	726,283	2	659,924	2	627,514	4	291,271
2	Macon	2	454,029	1	685,335	1	788,563	1	511,566
3	Lafayette	3	352,603	3	347,600	3	371,928	2	296,931
4	Ray	4	282,247	5	272,948	4	319,405	6	196,852
5	Randolph	5	224,758	4	297,011	6	219,762	5	209,656
6	Henry	6	144,139	6	137,258	8	125,962	8	84,473
7	Putnam	7	123,526	7	134,984	7	145,641	7	119,832
8	Vernon	8	64,303	8	119,036	5	234,376	3	297,599
9	Barton	9	63,026	9	108,784	9	61,301	10	55,767
10	Grundy	10	28,983	13	28,670	12	35,770	12	35,000
11	Linn	11	28,036	11	35,588	10	48,302	9	71,807
12	Boone	12	23,577	14	21,058	14	25,602	17	19,038
13	Caldwell	13	22,661	10	38,333	13	29,020	14	22,869
14	Audrain	14	19,569	12	29,792	11	42,262	11	43,910
15	Adair	15	17,110	17	14,820	16	20,957	15	20,744
16	Callaway	16	15,581	15	16,551	15	23,961	13	23,223
17	Montgomery	17	13,124	16	16,039	17	15,923	19	12,175
18	Johnson	18	10,530	18	10,485	18	12,101	18	15,427
19	Clay	19	8,289	....	....	19	7,139	16	19,371
20	Saline	20	7,981	22	4,440	26	1,865	29	1,875
21	St. Clair	21	3,866	21	5,405	21	6,517	22	5,337
22	Dade	22	3,402	20	6,881	20	6,695	27	2,327
23	Nodaway	23	2,222	26	1,850	24	2,548	25	2,984
24	Cooper	24	2,200	24	3,666	23	2,892	26	2,639
25	Cole	25	2,000	27	1,548	27	1,200	28	2,000
26	Cedar	26	1,264	23	4,181	33	890	33	730
27	Chariton	27	1,170	25	2,312	28	1,136	34	185
28	Jasper	28	633	....	....	....	....	....	....
29	Ralls	29	614	32	280	25	2,160	23	4,400
30	Sullivan	30	560	19	8,800	31	1,000	21	6,600
31	Pettis	....	....	31	433	34	181	30	1,738
32	Moniteau	31	476	....	....	....	....	....	....
33	Schuyler	32	280	30	766	32	692	24	3,556
34	Livingston	33	200	29	1,000	30	1,000	32	800
35	Miller	34	130	33	127	....	....	....	....
36	*Morgan*	35	36	....	....	....	....	....	....

in order of production for each of past eleven years.

1895.		1896.		1897.		1898.		1899.		1900.		1901.	
Rank.	Product, tons.	Rank.	Product, tons.	Rank.	Product, tons.	Rank.	Product, tons.	Rank.	Product, tons.	Rank.	Product, tons.	Rank.	Product, tons.
3	252,231	2	375,300	2	410,304	3	343,878	2	441,983	3	363,577	4	347,047
1	539,120	1	519,649	1	490,601	1	720,999	1	739,293	1	595,297	1	1,025,213
2	256,761	3	307,286	3	284,448	2	347,857	3	392,608	2	377,892	2	439,217
6	150,998	6	149,083	6	157,652	6	215,348	6	252,683	5	243,582	6	264,900
5	218,774	5	230,194	5	243,012	4	314,842	4	354,830	4	303,133	3	432,655
9	99,058	9	78,551	8	76,023	10	68,261	9	81,373	9	129,902	10	103,267
7	111,572	8	85,032	7	101,330	7	121,952	7	126,673	10	106,203	9	139,456
4	237,965	4	303,886	4	281,894	5	252,134	5	298,382	6	229,343	8	164,972
10	76,242	12	37,570	9	70,554	8	104,233	11	67,844	8	141,520	7	183,983
12	37,200	10	41,000	11	35,402	12	39,974	13	39,633	13	42,371	13	42,361
8	100,179	7	92,022	10	67,895	9	83,011	10	72,081	11	81,130	11	85,459
14	21,090	15	20,428	18	14,127	16	16,780	14	29,665	17	19,179	16	21,549
16	17,876	16	19,780	16	20,000	14	23,000	15	28,000	14	26,000	18	19,021
11	40,918	11	37,611	12	35,167	13	36,438	12	40,759	12	43,530	12	44,066
13	24,540	13	23,510	13	27,078	11	62,215	8	104,868	7	181,577	5	347,047
15	18,771	14	22,182	15	20,152	15	21,281	17	22,356	18	15,120	15	21,562
18	10,900	18	10,736	17	15,200	26	2,740	27	2,670	29	1,675	28	1,080
19	8,873	24	3,961	23	3,770	21	4,318	23	4,710	20	8,455	20	9,695
23	4,000	20	6,500	19	9,000	30	1,500	20	8,000	19	12,800	19	16,681
24	3,682	32	432	32	1,281	35	740	32	1,320	34	500	35	942
21	5,487	23	4,058	21	5,452	23	3,596	25	4,210	22	3,892	22	4,539
22	5,066	22	4,570	23	2,980	20	4,495	22	4,930	28	2,350	21	5,393
29	1,802	21	6,065	24	2,769	33	1,000	29	2,350	27	2,371	26	2,000
27	2,492	31	750	34	250	36	514	36	320	32	1,000	33	1,265
22	1,120	....	....	22	3,794	22	3,704	19	8,600	....	....	25	2,280
31	1,590	28	1,863	27	2,178	32	1,244	30	2,116	31	1,095	27	1,730
28	1,858	33	355	29	1,573	24	3,488	24	4,517	25	2,940	30	1,447
....	....	....	....	....	....	....	....	....	....	....	....	....	....
20	8,489	19	9,644	20	7,843	18	7,768	18	16,014	15	20,956	14	25,238
34	1,000	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	30	1,470	19	5,400	26	3,200	....	....	....	....
....	....	....	....	....	....	....	....	....	....	....	....	36	480
30	1,620	26	2,440	28	2,022	25	2,921	21	5,304	21	4,253	23	3,800
33	1,050	29	1,155	31	1,468	27	1,817	34	800	23	3,813	34	1,177
....	....	....	....	....	....	....	....	....	....	....	....	....	....
....	....	....	....	....	....	31	1,440	....	....	35	300	29	1,674

TABLE X—SHOWING RANK OF COAL PRODUCING COUNTIES

No. counties.	Counties.	1891.		1892.		1893.		1894.	
		Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.
37	Monroe	36	12	...	....	....	....	....	....
38	Lincoln	....	....	....	....	....	....	....	....
39	Carroll	..	....	28	1,380	29	1,088	31	926
40	Jackson	....	....	....	....	22	4,819	20	6,720
41	Howard	....	....	....	....	....	....	....	....
42	Cass	....	....	....	....	....	....	....	....
	Totals	....	2,650,018	....	3,017,285	....	3,190,442	....	2,383,322

IN ORDER OF PRODUCTION FOR EACH OF PAST NINE YEARS—Continued.

1895.		1896.		1897.		1898.		1899.		1900.		1901.	
Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tons.	Rank...	Product, tous.	Rank...	Product, tons.
....	....	....	....	....	....	28	1,810	33	960	33	822	31	1,445
....	....	....	....	....	....	....	....	....	....	36	270	....	....
26	2,664	27	2,304	26	2,225	34	803	28	2,397	30	1,575	32	1,430
17	14,632	17	18,000	14	21,028	17	15,000	16	25,125	16	20,900	17	20,000
25	3,460	25	3,220	25	2,240	....	....	35	456	24	2,944	24	3,685
....	....	30	1,000	33	1,206	29	1,558	31	1,321	26	2,745	....	....
...	2,283,081	....	2,420.147	....	2,429,388	....	2,838.152	....	3.191,811	....	2,995,022	....	3,810,767

LIST OF COAL COMPANIES AND OPERATORS OF SAME.

ADAIR COUNTY.

Company.	Operator.	Postoffice address.
American Fuel Co., Mine No. 1	American Fuel Co.	Stahl
Besanko, Robt.	Robt. Besanko.	Fegley
Culler Bros. (Culler Mine)	Thos. Scott	"
C. B. Havens (Danforth)	O. B. Havens & Co.	Omaha, Neb.
Kansas City Midland O. and M. Co.	Kansas City Midland O. & M. Co.	Kansas City
McCabe, Patrick	Patrick McCabe.	Fegley
Manufacturers' C. & C. Co., Mine Nos. 1 and 2	Manufacturers' C. & O. Co.	Kansas City
Motter, Noah (Miller Mine)	F. J. Miller	Fegley
Oak Block Coal Co. (Corporation)	Oak Block Coal Co. (Corporation)	Kirksville
Paris, John	John Paris	Novinger
Rombauer Coal Co.	Rombauer C. Co., Mine Nos. 1 & 2.	"
Scott & Son (Hazel Creek)	D. C. Scott	Fegley

AUDRAIN COUNTY.

Bevan, Wm. (Curver Creek Mine)	Wm. Bevan	Laddonia.
Carr, Paris	Paris Carr	Benton City
Farber Mine	Lawder & Peterson	Farber
Hafner, O. F. (Worcester Mine)	Jos. Holtkamp.	Worcester
Johnston, R. E. (McGuire Mine)	G. W. McGuire.	Martinsburg
Krieger Coal Co.	Oscar Krieger	"
Standard Coal Co.	Joe Sanford	Vandalia
Mississippi Glass Co.	Mississippi Glass Co.	"
Vandalia Coal Co.	Vandalia Coal Co.	"

BARTON COUNTY.

Bell, J. W.	J. W. Bell	Lamar
Chancelor, H. C., Sr.	Joxie Brown	Minden Mines
Divine, W. B.	W. B. Divine	Newport
Gray Coal Co.	F. R. Gray	Midway, Kas.
Hanshaw, W. H.	W. H. Hanshaw	Liberal
Lasby, M.	G. W. Claunch	Mulberry, Kansas, Route No. 2
Miller, W. L.	Sanford Bro. Mercantile Co.	Minden Mines
Prosser, J. J.	Prosser, Sanders & Sanders	Liberal
Richards, Louisa Mrs.	C. A. Richards	"
Spear, M. M.	M. M. Spear	Lamar
Stockton, E.	E. Stockton	Liberal
Travis Mine	Joe Travis	"
VanFelt, C.	C. F. Swigert	Minden Mines.
Walser, G. H.	Rogers & Nicholson	Liberal
" "	Geo. Mellor	"
Wear Coal Co., Mine No. 3	Wear Coal Co.	Pittsburg, Kas.
" " " No. 10	" "	" "
Western Coal Co., Mine No. 8	Western Coal Co.	Pittsburg, Kas., and St. Louis
" " " No. 9	" " (Hall & Fletcher)	Minden Mines

BATES COUNTY.

Company.	Operator.	Postoffice address.
Ackerman, Jas.	Jas. Ackerman	Hume
Brooks, J. J.	J. J. Brooks	Rich Hill
Craig, T. A	T. A. Craig	Worland
Darby, J. W	W. H. Mace	Foster
Engels, L. G	J. T Engels	Rich Hill
Kansas-Missouri Land and Coal Co.	W. W. Peeler	Rockville
Lewis, O. H	Harris Gerrodo	Worland
Martin, F. M.	F. M. Martin	Rich Hill
Metzler Coal Co.	Metzler Coal Co.	Foster
Missouri Pacific Railroad Co.	J. Newcomb	"
Parker, L. W	K. C. Hines	Rich Hill
Pearson, Peter	Peter Pearson	"
Prose Mine	Briscoe & Prose Co	Foster
Rankin Mine	B. Cooper	Amsterdam
Rich Hill Coal Co	Rich Hill Coal Co., Mine 15.	St. Louis
" "	" " " 22	"
" "	Berteau Bros.	Rich Hill
" "	J. C. Griggs	"
" "	W. H. Lowder	"
" "	D. McComb	"
" "	R. Pearson	"
" "	S. Reese	"
" "	Vernon Coal Co	"
Scott, Sarah	Hensley & Mullis	Foster
Selders Bros	Selders Bros.	"
Steele, D. W	D. W. Steele	"
Tatley, J. V. Coal Co	J. V. Tatley	Worland
Thomas, Mark	Mark Thomas	Foster
Walnut-Land & Coal Co	C. T. Bishop	"
" "	S. L. Queen	"
Western Coal & Mining Co	J. C. Rankin	Worland

BOONE COUNTY.

Beasley, W. H	John Gossett	Harrisburg
Buckler, H. J	H. T. Buckler	Rucker
Columbia Coal Co	R. E. Henry	Columbia
Davis, I. R	Isaac R. Davis	Brown Station
Gilvin Mine	J. R. Gilvin	Harrisburg
Keene, J. H	Jas. H. Keene	Columbia
McKenzie, J. F	J. F. McKenzie	Harrisburg
Prather, S. S	W. R. Prather	Columbia
Robinson, J. W	T. B. Hord	Harrisburg
Sublett, S. T	S. T. Sublett	Columbia
White Bros	J. H. & Wm. White	Rucker

CALDWELL COUNTY.

Caldwell Coal Co	Caldwell Coal Co	Hamilton
Dripping Springs Coal Co	Dripping Springs Coal Co.	Kingston

CALLAWAY COUNTY.

Castle, Wm	Wm. Castle	Fulton
Curd, Edwin	Edwin Curd	"
" "	John Marsinkoff	"
Fulton Fire Brick Co	F. F. B. & M. Co	"
Harris, John	John Harris	"
Homer, Jos	R. F. Thorp	"
Reed, J. F	J. F. Reed	"
Smith Jas	Jas. Smith	"
" "	Wm. Simmons	"
Sims Bro's. Coal Co	Sims Bro's. Coal Co	"

CARROLL COUNTY.

Company.	Operator.	Postoffice address.
Farr, Robt	Robt. Farr	Little Compton
Gallaher, W. P.	W. R. Gallaher & B. White	" "
Hughes, Wm	Wm. Hughes	" "
Ogle, W. F	W. F. Ogle	" "

CEDAR COUNTY.

Beebe, E. M	E. M. Beebe	Lebeck
Duncan, J. C	H. Parvin	Jerico
Dial, J. Mrs	John Conner	Filley
Poague, G. M	G. M. Poague	Jerico
Schroder, C. M.	C. M. Schroder	Eldorado Springs
Smith, Wm	Wm. Smith	Jerico
Young, J. H	G. A. Smith	Filley

CHARITON COUNTY.

Huenten, John	Robt. Brewer	Guthridge Mills
Isle, R. W.	R. W. Isle	Indian Grove
Kahler, W. J	W. J. Kahler	Newcomer
Wachter, H	H. Wachter	Salisbury

CLAY COUNTY.

Missouri City Coal Co	Missouri City Coal Co	Missouri City

COLE COUNTY.

Edwards & Kauffman	Edwards & Kauffman	Elston
Urban, Wm	Wm. Urban	"

COOPER COUNTY.

Hazel Springs Coal Mines	C. W. Hazell	Boonville

DADE COUNTY.

Hickman, O.	A. Leonard	Sylvania
McCluey, Robt	Robt. McCluey	"
"	J. A. Clayton	"
McElhinney, B. D	Finney & Summonds	"
McCombs Mine	Thos. Gardner	"

GRUNDY COUNTY.

Grundy County Coal Co	Grundy County Coal Co	Trenton

HENRY COUNTY.

Company.	Operator.	Postoffice address.
Beedy, M	W. E. Hughes	Windsor
Bigum Mine.	Rosse & Bigum	Deepwater
Blair, John O.	Cooper Creek Coal Co.	Brownington
Bowen Bro	Bowen Bro.	Lewis Station
Burgess, L. L.	L. L. Burgess	Piper
Chappell, J. R	C. W. Field	Windsor
Clark, David	David Clark	Montrose
Co-operative Coal and Mine Co.	Co-operative Coal Co.	Lewis Station
Daley, G. G.	E. A. Barnharf	Clinton
Demaree, H. T.	H. T. Demaree	Deepwater
Dickey, W. S.. Clay Mfg. Co	W. S. Dickey, Clay Mfg. Co.	"
Engeman, Chas.	Chas Engeman	Montrose
Geahart, Theo	Theo. Geahart	Clinton Route 7
Hines, F. B.	C. W. Field	Windsor
Hobbs, H. B.	Denzler & Church Coal Co.	Brownington
Hurst, Jos.	J. Hurst	Deepwater.
Jordan Coal Co	Jordan Coal Co	Clinton
Miller, W. F.	L. M. Beaman	Windsor
Owen, J.	C. Guphert & Grover	Garland
Owen, W. E.	E. A. Barnehart	Clinton
Rigg, D. B	Chapman & Dalton	Lewis Station
Rusk, Wm.	C. Roady	Deepwater
Salmon & Salmon.	Wm. Reese	"
Smith, J. W	J. W. Smith	"
Feeman, Jno	Jno. Teeman	Montrose
Thompson, Jno	Jno. Thompson	Brownington
Tyree, Jos.	Jos. Tyree	Montrose
Wilson, Thos. P	Hurt & O'Neal	"

HOWARD COUNTY.

W. R. Graham	W. R. Graham	Fayette
Lockridge, B. M	Jno. Hinch	"
Morrison, A. W	R. S. Jackson	"

JACKSON COUNTY.

Brush Creek Mine	Brush Creek Coal Mining Co	Kansas City

JOHNSON COUNTY.

Adams, G. W	J. W. Steels	Warrensburg
Bancroft, G. M	DeWitt C. Woolery	Montserrat
Boyd & Son, Thos	Thos. Boyd & Son	Knobnoster
Christopher, J. H	F. Millard	Warrensburg
Hardin, John	L. M. Herrington	Bristle Ridge
Hanna & Co., L. E	L. E. Hanna & Co	Montserrat
Macknod, Isaac	D. A. Bullick	Warrensburg
elley, M. B	M. B. Melley	"
k, W. L	E. T. Strickland	Dunksburg

LAFAYETTE COUNTY.

Company.	Operator.	Postoffice address.
Anderson, August	August Anderson	Lexington
Bell, W. H	W. H. Bell	Corder
Bell & Greer	Bell & Greer	Lexington
Bonanza Coal Co.	S. W. Brandon	Higginsville
Buckhorn Coal Co	S. Mc. R. Calloway	Waverly
Carter Coal Co.	Carter Coal Co.	Wellington
Chancelor, C. A.	C. A. Chancelor	Lexington
Consolidated Farmers' Coal Co.	Consolidated Farmers' Coal Co.	Higginsville
Corder Coal Co.	H. G. Asbury	Corder
Diamond Coal Co.	C. S. Wilson, Mgr	Corder
Dover Coal Co.	Dover Coal Co.	Lexington
Edmunds, J. A.	J. A. Edmunds	"
Farmers' Coal Co.	G. B. Beatty, Mine No. 2 & 3	Kansas City
Feith, Wm.	Kratz & Grim	Higginsville
Frerking, H. F.	H. F. Frerking	Concordia
Garn, R. B.	R. Y. Rowland	Odessa
Gaffin, O. M.	O. M. Gaffin	Lexington
Geisendorfer, S. F.	S. F. Greisendorfer	Corder
Hendricks, S. B. Miss	M. Bartels	Concordia
Hendricks, S. Mrs	H. Bartels	"
Hoffman, E. J.	E. J. Hoffman	Higginsville
Hohenwald Bros	O. R. Hohenwald	Corder
Hudson, Jas.	Jas. Hudson	Higginsville
Independence Coal Mining Co.	L. B. Zeitz	Independence
Jones, Emma Mrs	W. Alcorn	Higginsville
Kreese, A. F.	A. F. Kreese	Concordia
Labor Exchange Coal M. Ass'n	Labor Exchange Coal M. Ass'n	Wellington
Lexington Coal Co.	L. C. M. Co., Glen Oak shaft	St. Louis
" "	" Graddy "	"
" "	" McDowell "	"
" "	" Midway "	"
" "	" No. 1 Riverton shaft	"
" "	" Seawell shaft	"
" "	" Valley shaft	"
Longest, J. R.	J. S. Stephenson	Higginsville
Looney Mine	Ballew & Glandish	"
McGrew, J. C.	J. C. McGrew	Lexington
Macey Estate, Henry	Henry Macey Estate	Kansas City
Mayview Coal Co.	B. F. Cary	"
Morgan, W. T.	W. P. Morgan	Corder
Morrison & Wentworth Bank	Star Coal Co.	Lexington
Perry, Thos.	Thos. Perry	Bates City
Rosewell Bros., Jas.	Jas. Rosewell & Bro.	Lexington
Salt Fork Coal Co.	Salt Fork Coal & Mining Co.	Corder
Silver Creek Coal Co.	Jones & Mitchell	Waverly
Strothers, F. T.	F. T. Strothers	Bates City
Summers, M. W.	M. W. Summers	Alma
Walton Mines	J. T. Walton	Lexington
Walton, J. F.	Seth Spruce	"
Wellington Coal Co.	Labor Exchange, Branch No. 330	Wellington
Williamson, C. T.	Shackelford & Borland	Bates City
Woskoski, M.	Mike Woskoski	Higginsville
Serat, M. E.	M. E. Serat	Kansas City

LINN COUNTY.

Black Plume Mine	W. N. Nickell	Brookfield
Brookfield Coal Co.	Brookfield Coal Co.	"
Burdell Mine	Burdett & Johnson	"
Landreth Mine	Landreth & Sons	Marceline
Marceline Coal Co.	Marceline Coal Co.	"
Schaefer, Bernard	Bernard Schaefer	Brookfield
Williamson, L. R.	L. A. Williamson	"

LIVINGSTON COUNTY.

Adams, J. A.	J. A. Adams	Chillicothe
Cox's Star Mine	W. L. Cox & Bro.	"
Gorlich, C.	J. W. Tindell	Mooresville

MACON COUNTY.

Company.	Operator.	Postoffice address.
Bevier Black Diamond	Bevier Black Diamond	Bevier
Helmet Mining Co	Helmet Mining Co.	Kansas City
James, Levi, Mrs	James Bros.	Bevier
Kansas & Texas Coal Co	Kas. & Texas C. Co., Mine No. 52.	St. Louis
" " "	" " " No. 57.	"
" " "	" " " No. 61.	"
" " "	" " " No. 66.	"
" " "	" " " No. 68.	"
" " "	" " " No. 69.	"
" " "	" " " No. 70.	"
Murlin Coal Co	Murlin Coal Co.	Bevier
Northwestern Coal & Mining Co	Northwestern Coal & Mining Co.	"
Richmond, J. G	J. G. Richmond	College Mound
Thomas, Rowland	Rowland Thomas	Bevier
Watson Coal Co	W. S. Watson	"

MONITEAU COUNTY.

Bowlen, Rohrback Mining Co	Bowlen, Rohrback Mining Co	California

MONROE COUNTY.

Grier, W. T	Grier & Pool	Paris
Montgomery, W. J	W. J. Montgomery	"

MORGAN COUNTY.

Hubbard & Moore	Hubbard & Moore	Versailles

MONTGOMERY COUNTY.

Hayes, F	Hayes Bro. & Johnson	Wellsville
Whitehead, Henry	Henry Whitehead	"

NODAWAY COUNTY.

Carpenter, Wroe	J. C. Pearson	Quitman
Potts, Wm	W. Potts	Burlington
Slaughter, J. Mary	J. S. Davis	Quitman

PUTNAM COUNTY.

kbird Coal Co.	Blackbird Coal Co.	St. Joseph
kenship, Thos	Smith & Whitaker	Pineville
, Hugh	Hugh Dixon	Cincinnati, Ia
, C. E.	C. E. Dodge	Unionville,
ng & Son, Thos	Star Coal Co.	Pearl City
, Alex	Alex Guffey	Unionville
, Thos	Thos. Lynch	Rosenwood
ta Coal Co.	Mendota Coal Co.. Mine Nos. 2 and 8	Mendota
"	Arnold Bro's Mine No. 9	"
"	H. Medlin " " 7	"
David	David Mincar	Rosewood
. B	Smith and Lynch	"
Jake	Jake Robison	"
W	Rogers Bro's	Pearl City
	Dan Shean	Unionville
on	Wilson Trent	Rosewood

RALLS COUNTY.

Company.	Operator.	Postoffice address.
Barger, J. A	J. A. Barger	Perry
Fitzpatrick Bro's	Fitzpatrick Bro's	“
Perry Coal Co	Perry Coal Co	“
Ralls County Coal Co	Ralls County Coal Co., Mine Nos. 1 and 2	“
Salling Coal Co	Salling Coal Co	“

RANDOLPH COUNTY.

Bickington, Jane Mrs.	Boone & Graves	Moberly
Brown & Wellesley	Brown & Wellesley	Renick
Cooper & Stockhouse	A. B. Cooper & Co	Moberly
Edwards, Emanuel	Emanuel Edwards	Huntsville
Elliott Coal Co	Elliott Coal Co. (Elliott)	Elliott
“ “	“ “ (Santiago)	“
Enterprise Coal Co	Jno. Cronan	Moberly
Higbee Coal Co	Higbee Coal Co., Mine No. 1	Higbee
“ “	“ “ “ No. 2	“
Interstate Mining Co	Walton “	“
Lewis & Sons, J. J	J. J. Lewis	Huntsville
McKiernan, W. H	W. H. McKiernan	Moberly
Mitchell, W. E	W. E. Mitchell	Huntsville
Morris Coal Co	Morris Coal Co., Mine No. 10	“
Murlin “	Murlin Coal Co	Bevier
Robinson, J. F	J. F. Robinson	Huntsville
Ward, Harry	Harry Ward	Moberly

RAY COUNTY.

Blair, Andrew	Andrew Blair	Richmond
Bryant & Kine	S. G. S. Bean	Lakeview
Campbell, Margaret	W. Sickers	“
Chenault, A. & R	A. R. Chenault	Henry
Crespin, E. E., Mrs	Crespin & Ward	Richmond
Fowler Coal & Mining Co	Fowler Coal & Mining Co	“
Hubbell Coal Co	Hubbell Coal Co., Mine No. 10	“
Hulett	Schooler & Thompson	“
Huston, Jas	Jas. Huston	Lakeview
Kallenberger, J. J	J. J. Kallenberger	“
Kansas & Texas Coal Co	Murlin Coal Co., Mine No. 30	Bevier
Loeven, Joseph	Jos. Loeven	Lakeview
Marshall & Johnston heirs	Jas. M. Edgar	“
Mercantile Coal Co., Mine No. 7&17	Mercantile C. Co., Mines Nos. 7&17	St. Joseph
Murry, Jessie	J. Kraft & Son	Henry
Pence Bros. & Calven	Pence Bros. & Calven	Richmond
Pence, Hughes & Gibson	Pence & Co	“
Pickering, Joseph	Pickering Coal Co	“
Rankin, W. D	A. F. Rankin	“
Richmond & Camden Coal Co	Mines 4, 5, 9, 12 & 14. Camden 1 & 2 Richmond & Camden Coal Co	“
Sevier, Chas	Ottman & Swope	“
Starr, Alex	Frank Hemmer	Hardin
The Grimes Mine	Hugh Blair	Knoxvill
Washington, A. L	S. H. Washington	Richmon
Wilson, Mary Mrs	Wilson Coal Co	“

SALINE COUNTY.

Banks, Ira O	Ira O. Banks	Blackbu
Terrell, Henry	T. S. Maupin	Elmwoo
Terrell, H. O	Tim Maupin	“

ST. CLAIR COUNTY.

Company.	Operator.	Postoffice address.
Cook, Jas	Jas. Cook	Appleton City
Crowell, H. C	O. S. Butcher	Lowry City
Griggs, L. L.	L. L. Griggs	"
Hoover Mines	Thos. Greathouse	Osceola
" "	O. F. Seymour	"
Kneirim, John	Geo. H. Kneirim	Deepwater
Oliver, Alex	W. F. St. Clair	Appleton City
Short Estate	J. M. Short	Iuka Springs
Sholz, J	W. H. Lane	Appleton City
Woodin, H. M	H. M. Woodin	Monegaw Springs

SCHUYLER COUNTY.

Galston, Ira	Ira Galston	Quen City
Kloke & Rosenteal	Bradburn & Co.	Zolo

VERNON COUNTY.

Arthur Coal and Mining Co	Arthur Coal and Mining Co	Panama
Augur, F. B., Hill Mine	F. C. Augur	Moundville
" " Hubb "	" "	"
Baker Frank	Frank Baker	Sheldon
Central C. and C. Co. Mine No. 14	Central C. and C. Co., Mine No. 14	Kasas City
" " " " 19	" " " " 19	" "
Ewing, F. Y	Goodwin & Smith	Harwood
Jones, P. W	D. K. Perkins	Moundville
Lowes, J. A.	J. A. Lowes	Sheldon
Mayberry, E. M	F. M. Mayberry	Harwood
Miller, J. F	A. S. Brown	Moundville
Radde, F. M	F. M. Radde	Harwood
Rush Coal and Mining Co	Rush Coal and Mining Co.	Rich Hill
Vernon Coal Co	J. A. Gee	" "
Whitworth Chas	Chas. Whitworth	Moundville

ERRATA.

Page 40—**Sixteenth** line, "beefit" should be "benefit."

Page 40—**Twenty-seventh** line "nd" should be "see."

Page 45—**Fourth** line from bottom, should be "where."

Page 62—**First** line should read "drivers and two shot-firers and one trackman. From the above it will"

Page 91—**Fifteenth** line, "cart" should be "cast."

Page 100—**Third** line from bottom, "of" should be "for."

Page 124—**Fourth** line "hoising" should be "hoisting."

Page 128—**Fifteenth** line from bottom, "accentable" should be "acceptable."

Page 134—**Last** line "cnoditon" should be "condition."

Page 138—"Stay Coal Co." should be "Star Coal Co."

Page 138—"Arell & Serrat should be "Aull & Serrat."

Page 166—**Tenth** line "haveen" should be "have been."

Page 172—**Twenty-second** line, "cole" should be "coal."

Missouri. Mines [illegible]
Annual report 1901 ; part 1 ;

15TH ANNUAL REPORT

OF THE

State Lead and Zinc Mine Inspector

OF THE

STATE OF MISSOURI.

FOR THE

YEAR ENDING DECEMBER 31, 1901.

JEFFERSON CITY, MO.:
TRIBUNE PRINTING COMPANY, STATE PRINTERS AND BINDERS
1902.

THE NEW YORK
PUBLIC LIBRARY
189497
ASTOR, LENOX AND
TILDEN FOUNDATIONS.
R ~~1910~~ L
1903

CONTENTS.

Page
Accidents—remarks on fatalities ... 216
  Tables 8, 9, 10 and 11 ... 236-241
Baryta, production of ... 164
Diamond drilling—remarks on ... 20
Introductory ... 9
Iron ore production ... 164
Letter of transmittal ... 8
Mining laws—recommendations ... 18
Nickel & Cobalt—article on ... 152-153
Remarks on report ... 15
Tripoli production ... 164
  Article on ... 161
Table 1—lead and zinc comparative statement 1900-1901 ... 17
Barry county—table showing production, etc ... 185-186
Benton county—table showing production, etc ... 186-187
Camden county—remarks on ... 132
Christian county—table showing production, etc ... 189-190
Cole county—remarks on ... 128
  Table showing production, etc ... 188-189
Franklin county—remarks on ... 158
  Table showing production, etc ... 212
Greene county—table showing production, etc ... 191-192
Hickory county—remarks on ... 118
Howell county—remarks on ... 136
Jasper county—tables ... 93-170
Jasper county—mines and mining companies ... 24
  American Zinc, Lead & Smelting Co ... 26
  Aida Mining Co ... 32
  Bailey & Stickney ... 32
  Barbee & Yale ... 32
  Bay State Zinc Mining Co ... 33
  Beckwith-Hall Mining Co ... 33
  Big Six Development Co ... 33
  Boston Get There Zinc Co ... 34
  Boston-Duenweg Mining Co ... 35
  Boqua Mining Co ... 36
  Bradford-Kansas City Mining Co ... 37
  Burgner Mining Co ... 37
  Bunco Mining Co ... 37
  Center Creek Mining Co ... 38
  Consolidated Zinc & Lead Co ... 42
  Conkey Independent Lease ... 42
  Colorado-Joplin Mining Co ... 42
  Continental Zinc & Lead Mining & Smelting Co ... 43
  Crown Crest Z. & L. Mining Co ... 45
  Davey & Son ... 46
  Dinkelbihler Lease ... 46
  Della S. Mining Co ... 47
  Eclipse Mining Co ... 47
  Excel Mining & Prospecting Co ... 47
  Eldorado Mining Co. ... 47
  Eleventh Hour Mining Co ... 48

Jasper county—Continued—

	Page
Empire Zinc Co	49
Estrada Lease	49
East Hollow Mining Co	49
Freeman Land & Mining Co	50
Forristall & O'Donald	50
Gilchrist-Porter Realty Co	50
Granby Mining & Smelting Co. and Lessees	50
Hagadorn, R.	55
Holden Bros. Mining Co	55
Homestead Z. & L. Mining Co	56
Hudson Mining Co	56
Ihlseng Mining Co	56
I Know Mine	56
Independence Mining Co	57
Investors' Mining Co	57
Ishpeming Mining Co. and Lessees	58
Jeannette Mining Co	58
John Jackson Mining Co	59
Johnson, Willett & Co	60
Katie "C" Mining Co	60
Leckie Mining Co	60
Lewellen Bros	61
Lucky Tom Mining Co	61
Lincoln Mining Co	61
Leonard M. & R. Co. and Lessees	61
Lead Hill Mining Co	63
Montgomery L. & Z. Mining Co	63
Mt. Ararat Mining Co. and Lessees	63
McKinley Mining Co. and Lessees	64
McMillan & Raymond	65
Manhattan Mining Co	65
Massassoit L. & Z. Co	65
Missouri Lead & Zinc Co. and Lessees	66
Missouri Zinc Fields Co	68
Midway Mines	68
Mistletoe Mining Co	68
Neely Mining Co	69
North Heights Addition	69
North Joplin Mining Co	70
Old Colony Z. & S. Co	70
Owensboro-Joplin Mining Co	70
Olympia Zinc Co	71
Oxford Mining Co	71
Perkins Zinc Co	72
Phelps & Connor	73
Porto Rico Mining Co	73
Pleasant Valley Mining Co	73
Perry Leases	73
Rabbits' Foot Zinc Mining Co	74
Rannabarger Mining Co	74
Regan Land	74
Rex Mining & Smelting Co	75
Roaring Springs Land & Mining Co	75
Sphinx Mining Co	76
Stuckey Mining Co	77
Sultana Mining Co	77
Sharpsburg	77
Short Creek Mining Co	78
South Joplin Lead & Zinc Mining Co	78
Sadtler Lead & Zinc Co	78
South Joplin Land Co	78

Jasper county—Continued—

Page

- Ten O'clock Mining Co. 79
- Troup Mining Co. 79
- United Zinc Companies 80
- Venture Mining Co 90
- Waddell & Co 90
- Witch Hazel Mining Co 91
- Wright Mining Co 91
- Willapus Wallapus Mining Co. 91
- Yale & O'Brien 92

Newton county—remarks 99
- Table showing production 202- 204
- United Zinc Companies 102
- Sulphide Corporation 102
- Fox River Lead & Zinc Co 103
- Alta Mining Co 103
- Saginaw Lead & Zinc Co 103
- St. Paul Mining Co 104
- Old Spurgeon, Easy Street & Noxall Mining Co 104
- Nemo Mining Co 105
- Aunt Patty Mining Co 105
- German-American Mining Co 105
- Gobbler Mining & Smelting Co 105
- Laughlin & Brown 106
- Keystone Lead & Zinc Co 106
- Boston-Springfield Zinc Co 106
- Williams Land 107
- Shoal Creek Mining Co 107
- South Shoal Creek Mining Co 108

Lawrence county—table showing production 193- 195
- United Zinc Companies 108
- Stewart Land 112
- Mt. Vernon Mining Co 112
- The Reil Houston Mining & Smelting Co 113
- Boston-Aurora Zinc Co 113
- Chicago-Aurora Zinc & Lead Co 113
- Kentucky Mining Co 114
- A. L. Wilfley Land 114
- Terre Haute Land & Mining Co 114
- Sphalerite Mining Co 115
- Decatur Lead & Zinc Co 115
- Federal Lead & Zinc Co 115
- Louis F. Hyde Mining Co 116
- Cleveland-Aurora Mineral Land Co 116
- Sandy Hill Mining Co 116
- Producing counties of Southwest Missouri 117

Hickory county—remarks 118

Benton county—remarks 120
- The Americus Zinc, Lead Mining & Milling Co 120
- The Rockwell Mine 121
- The United States Mining Co 122
- The Columbia Mining Co 122
- The Melton No. 1 Mining Co 122

Morgan county—remarks 123
- Cohn & Redman 123

Moniteau county—remarks 124
- Fortuna Mining Co 127
- Gundling Mining Co 127
- The Moreau Mining Co 127
- La Mine Mining Co 128

Cole county—remarks 128
- *Blue Jack Mine* 129

Cole county—Continued—

Page

Farmer Diggings 129
ndependence Mine 129
Elston Mining Co 130
Chambers Mining Co 151
Hickory Hill Coal Deposit 130
Miller county—remarks 130
Table showing production 196, 197
Mary's Home Mine 131
Gageville Mines 131
Camden county—remarks 132
The Niangua Minning Co. 133
Wright county—remarks 134
Clara E. Lane 134
The Equitable Mining Co. 134
Red Bird Mine 134
Beatrice Mining Co 134
Ozark county—remarks 135
The Alice Mine 135
Howell county—remarks 136
Rex Zinc & Lead Mining Co 136
G. & G. Mining Co. 136
St. Francois county—remarks 137
Table showing production 205- 207
St. Louis Smelting & Refining Co 138
Elizabeth Lead Co 142
Derby Lead Co 142
Federal Lead Co. 142
The Union Lead Co. 143
Columbia Lead Co 143
Desloge Consolidated Lead Co. 143
Central Lead Co 144
Doe Run Lead Co 145
St. Joseph Lead Co 146
Madison county—remarks 148
Table showing production 208- 209
Mine La Motte 149
Catherine Lead Co. 150
North American Lead Co. 151
Franklin county—remarks 153
Belew Mining Co 155
Gt. Western Lead & Barytes Mining Co 155
Rock Island Mining Co 156
Sango Mining Co 156
Bartle Lead Co 157
Washington county—remarks 157
American Lead & Baryta Co 157
McArthur Mines 157
Old Mines 157
Shibboleth Mining Co 157
Renault Lead Co 158
Pittsburg Mining Co 159
Washington Land & Mining Co 159
rondale Lead & Mining Co 160
Jefferson county—remarks 161
Valle Mining Co. 161
Table III. Summary by counties 165- 166
Table IV. Average price of pig lead and spelter in New York for the 18 months ending Dec. 31, 1901 167
Table V. Prices of spelter 1875 to Dec. 31, 1901 168
Table VI. Zinc product of Missouri 1873 to 1901, inclusive 169
Postoffice directory of mining companies ..... [illegible]

LETTER OF TRANSMITTAL.

Hon. A. M. Dockery, Governor of Missouri:

Sir—I have the honor to submit the report on Lead and Zinc mines and mines other than coal for the year ending December 31st, 1901.

Very respectfully,
GEORGE K. WILLIAMS,
State Mine Inspector.

INTRODUCTORY.

This, the 15th annual report of the Lead and Zinc Mine Inspector, unlike former reports, covers a calendar year, instead of a fiscal year ending June 30th. The year 1901 proves to be one of substantial growth in face of a fluctuating, uncertain and declining market price. In spite of an inflated maximum price of $55.00 per ton received for zinc ore in April, 1900, the highest ever paid for the ore, it is a matter of satisfaction to record the fact that during the year 1901, with an average price received for zinc ore less almost half than was received the year before, this great Joplin district (and we mean the Missouri part of it) continued unrestricted in its production, eclipsing as it did by an output far in excess of all other years. No commendation of this superb district in its stability and permanency is required beyond the simple statement of these facts. In the light of subsequent events it but proves upon what a firm foundation the zinc industry of the State is based, as the year was not made phenominal by the expenditure of large sums of money in the development of new mines or new mills; but it was the legitimate outgrowth of pluck, good business methods and the fact that the ore is there if properly sought after. Old mines that were abandoned and given up as worked out have been revived with astonishing results, until now it has become out of date to speak of a property as cut or worked out. Many shallow runs indifferently worked heretofore have since proven good property, while deeper runs in many instances are proven and others as yet altogether neglected. Lands condemned as worthless have been found to be the richest, a case in point is the noted United Zinc Company's 80 acres in Chitwood Hollow. Here it is claimed three different attempts to prove the property resulted in failure, following upon the heels of this failure, however, an agent for the sale of this land informed its owner that he had made a sale of it to the United Zinc Companies at a certain figure; the owner remonstrated with his agent for making sale on any such terms, reminding him that he must have known that it was worthless as a mining proposition. Today this same property has more active, productive and successfully operated mines on it than any territory of like dimensions to be found anywhere. The truth is, that there is no royal road leading to the discovery of mineral deposits in any territory that we have ever heard of; yet all that territory in this State lying south of the Missouri river, developed and undeveloped, presents the most promising field for mining operations that can be found anywhere in this great country. While the ores in this State have not assisted in building up the collossal fortunes, possessed by men like Clark, Flood, Mackey and others; yet there is no risk in the assertion that no other mining section between the Atlantic and the Pacific, the great lakes on the north and the Gulf of Mexico, that can point to as many successful efforts, with so small an expenditure of money, time and labor as can the operators of this zinc district of Missouri. Experience teaches that there is no such thing as absolute safety in investments, this being true of all lines of business and trade. Mining and especially that class of it where the mineral sought is buried deep down in the bowels of the earth, in channels which have frequently been found so tortured in their course by the convulsions of nature, that neither theory or practice can determine the direction they may take, where they will abruptly end or where they will open up again, is the difficult problem at all times confronting the miner and of necessity makes mining in so many instances a risky business. After all it is the risks and ventures in life that enlivens and makes progress, being the exact opposite of trusts which have a tendency to grasp everything in sight and throttle all independent or individual effort. Much is said and written concerning mining, its hazards and its association with a species of gambling, and yet how are the precious and baser metals to be reached unless sought after through the very channels that some would condemn? Manifestly humanity, trade, business and our necessities demand them, and this of itself should put an end to the unjust criticism concerning the industry. If all minerals were deposited with the same continuity that we find in coal, values would decrease, and it is because of the fact that in the deposition of lead and zinc ores, it so frequently happens that a very rich run is followed by a poor one, that such results very often cause operators to be misled in either surrendering a good property when a temporary low run of ore is encountered, or on the other hand holding on too long in hope of better things.

If ore bodies could be verified by actual vision without the expense of blocking out the same by development work well advanced, the difficulties in mining would be solved. In this connection it will not be out of place to suggest that all mines have their development work well advanced as it will in the end prove a money and time saver.

No wider difference between the Southeast and Southwest districts is observable than that found in the fact that all large operators in the Southeast operate exclusively their own mines, while in the Southwest the very reverse of this is more and more the case. In the Southeast the deep shafts, the cost of sinking and opening up the mines, together with the cost of the necessary facilities for operating, is so great as to place it beyond the possibility or reach of men of small means to operate in that section. On the other hand in the Southwest it is a very common thing for two or three miners to club together, after securing a lease, sink a shaft and open up a mine without the fear of water or the cost of handling it, as it is of very common practice for the owner of a property to lease it with the understanding that the royalty will cover all pumping charges. This is a feature of such decided help to the small operator that it is difficult to measure its importance to him; as we know of no problem with which the small operator has to contend that will compare with that of water. Many a poor man has lost a rich prospect through inability to cope with the water he met with in his shaft. In this connection it is a pleasure to note very superior inducements being offered miners by some of our largest owners of mineral land, not only by the assistance furnished in pumping, but in the reduced royalties offered them. The tendency in the Joplin district by those holding the fee or original leasehold is to follow the lead of those who have grown rich as owners of mineral land, and today it is an exception to find a large company operating mines on its own account, their business being confined almost exclusively to pumping water, milling the ore and leasing the mining privileges.

Zinc ores, unlike lead ore, show a general increased production throughout the United States for the year 1901, the chief increase, however, coming from this State. Exports of the ore had reached considerable proportions, but during 1901, the trade fell off greatly owing to market conditions abroad. The Joplin district furnished for the year 1900 over 63 per cent of all the zinc ores mined in this country, having to her credit the chief increase for 1901, it is but natural to assume that for this year the percentage is much greater.

Much has been written relative to the cost and the prices for which zinc ore can be mined and sold. The figures furnished by this report will afford ample opportunity for those who argue that the Joplin district must have prices in excess of $24.00 and $25.00 per ton before realizing a profit, to change or modify their views. The figures furnished in this report, both as to production and average price, are taken from the books of the respective operators, which show an increased production for 1901 over 1900 of 37,777 tons or 20.28 per cent, and that the average price for the ore was $23.70 per ton for the year. No one familiar with the situation can claim that our zinc operators have been crippled or that as a whole that they have lost money. It is true some companies, by reasson of conditions most favorable average as high as $26.00 per ton, while still others average less than the general average price. If we are to reconcile the proposition that zinc ores cannot be mined with a profit when the ore sells at $24.00 per ton, then with what last year's experience demonstrates, we have to take it for granted that our mines are either very much richer in ore, producing better or that the methods employed in mining recently are much superior to former practice. What shall we do with the statement made us by the superintendent of the King Jack Mine, on the United Zinc Companies' property, if $24.00 must be the price before a profit is reached? The King Jack not only placed its ore in the bin ready for shipment after mining, cleaning and handling for $11.77 per ton, but this figure embraced the expense of development work also. Of course this is a very fine mine well managed, the margin of difference between his figures and the $24.00 however, is wide enough to assist a poor mine with the same kind of management. If this $24.00 figure is made to cover a long period, return the copital invested in mining land and make good the losses of those who engage in mining without a mine, it may not be far wrong, in fact it may be a little short in amount. The experiences in the zinc ore trade in Southwest Missouri for the year 1901 confirms and establishes the fact that it is upon a safe, permanent and profitable basis and the wider range of the uses to which zinc ore is applied, growing as they are, with each succeeding year, gives promise of still greater demand and much better prices than those which obtained during 1901.

The lead ore production of the entire country for the year 1901, but with one exception, showed a falling off in all sections, Missouri proving the exception with an output exceeding that of 1900 by 39 per cent and largely in excess of any year in her mining history. The Missouri ore carrying little or no silver appears to have been in greater demand than all other. Falling prices in the European markets caused a corresponding decrease in prices in this country, our State feeling it to the extent of a difference of $3.17 per ton compared with 1900.

The disseminated lead field of the State confined almost exclusively to St. Francois and Madison counties, produces 70 per cent of all the lead mined in the State, and to this section the increased output of lead for 1901 is largely due. With the number of extensive new mines opened recently and in contemplation, together with the wonderful plants supplied and to be supplied, furnished as they are and will be with the most modern appliances for the most rapid and economic handling of the product—no one can predict what the output of lead in Southeast Missouri will be in the near future. To take into consideration the immense bodies of ore proved by the diamond drill, the facilities unstintingly furnished for the extraction of it, with such an abundance of capital back of it all, nothing short of a national calamity can prevent an enormous production. Even at this day the importance of this section is but slightly known and as little appreciated by the great majority of our people. A trip from Bonne Terre, through Desloge, Flat River, thence to Elvins, would prove a revelation to many, for the entire distance can be traced by a string of mines continually in view.

Recent developments at Fredericktown at both the Catherine and American mines, furnish the prospect for another chain of mines if ever the Mine La Motte property comes under a progressive management. Southeast Missouri has been highly favored in the deposition of minerals, for where can one go to find a lead ore body of such continuity and so persistent over so great an area as this section furnishes? In this section there will also be found true fissure veins carrying silver; nickel and cobalt in greater quantity than found elsewhere in this country; copper has been mined at Mine La Motte and at Fredericktown; then there is its marble of as great beauty, strength and durability as can be desired, in great abundance.

The inspector notes the tendency toward larger and larger companies controlling great bodies of land. In Southeast Missouri the large concerns are a necessity, because everything connected with mining there is on a large scale requiring much capital. In the Southwest the large companies, while not operating mines to any extent, yet they are gradually acquiring more land and do a leasing business almost exclusively. Where the small operator is often at a disadvantage the larger concern relieves the situation by pumping the water and milling his product. No injury that is real or apparent has resulted to the small operator by reason of the increased number of large companies that we have noticed. On the other hand the large operator with the means and facilities, does as a rule, keep his mine in a safer and better sanitary condition, and it is not within our province to question the motives that produce such results. It is enough for us to know that under such management, our responsibilities are lessened, our duties simplified, and that we breathe easier when we know the management is good.

The increased prices reasonably anticipated for the current year, will tend more and more to the widening of our mineral territory. Central Missouri, especially by reason of the very rich bodies of ore developed in Moniteau and other counties, will be benefited.

The completion of the Colorado road now a part of the Rock Island system from St. Louis to Kansas City, will greatly assist in opening up a new field in which the surface indications are nowhere excelled in the State. Still other contemplated lines of road have very promising mineral fields contiguous to them, and with the undiminished but ever increasing production from older fields, Missouri will continue to hold her supremacy as an ore-producing State without fear of a rival.

REPORT.

This report shows a gratifying increase in the production of both lead and zinc ores during the year 1901. Under the head of zinc ores it will be seen by our tables that there were 207,234 tons of zinc of high grade and 16,839 tons of silicate or low grade ore mined, with a total zinc output of 224,073 tons as against 186,296 tons for the former year. The average price received for the ore, both grades, for the entire State shows $23.70 received per ton against $31.76 for the previous year. In this connection it may be well to call attention to the fact that some districts produce a greater quantity of low grade ore than others, with the result that the high grade districts suffer in the general average price given. It will, upon the examination of the tables, be found that very many mines receive a very much better price throughout the year than the average furnished.

The zinc ore product sold for $5,308,671, being $402,960 less in value than was obtained for the product for the fiscal year ending June 30, 1900. While the value of the product shows less, yet the output shows an increase of 37,777 tons. Had prices been maintained throughout the year 1901 or held with the average for the former period, $1,226,210 more would have been received by our operators than they did receive.

Lead ore shows an increase in both production and value, there having been mined during the year 109,376 tons compared with 78,538 tons for the former period or an increase of 30,838 tons. The product sold for a total of $4,865,518, as against a total of $3,762,202 or an increase over the fiscal year ending June 30, 1900, of $1,139,316. The average price received for lead ore during the year, however, was less than the year before; 1901 showing an average of $44.30 per ton compared with $47.47 for 1900. Zinc ores selling for a total of $5,308,671 and lead ores for $4,865,518 made a total for the two ores amounting to $10,158,266. as against $9,437,833 the year before. Had the prices received for the ores in 1900 held good for 1901, the value of the product for 1901 would show an increase over actual receipts from its sale amounting to $2,180,423.64.

There was an increased production of iron ore during the year, the output showing 140,280 tons as against 88,520 tons the previous year, an increase of 51,760 tons or 58½ per cent.

Baryta shows an output of 32,238 tons as against 23.62 tons, an increase of 8,756 tons or 37 per cent.

Tripoli with 3,660,000 pounds mined and shipped, shows an increased output of 1,189,000 pounds.

The counties producing lead and zinc ores this year number 23 in all and are as follows: Barry, Benton, Camden, Christian, Cole, Crawford, Dade, Franklin, Greene, Hickory, Howell, Jasper, Jefferson, Lawrence, Madison, Miller, Moniteau, Morgan, Newton, St. Francois, Washington, Webster, and Wright. The great bulk of the output however is furnished by a few of the above named, Jasper furnishing an output which sold for $5,460,853; St. Francois, $3,119,389; Newton, $688,135; Lawrence, $380,744; Madison, $190,730.

There are 111,484 acres of land owned and leased by operators, and reported by the same as mineral lands; but the above figures do not embrace all the acreage owned by mine operators.

Answers made to our questions concerning the amount of capital invested in land and plant, furnish a total of $18,710,506. This we are satisfied would fall far short of the amount that it would take to purchase this same property. Then again others answer this question by giving in the amount of the capital stock of the company, and quite frequently the figures are known to be largely in excess of the actual value of the land and equipment owned. Different companies are influenced from different motives in making answer to this question, and we imagine that in many cases it is a fear of the assessor, that causes many modest and conservative estimates to be made. While still other companies make no answer to the question whatever. It is because of a knowledge of some misleading statements along this line of answers made, that makes necessary on our part this explanation. Our records show that there were 895 mines, large and small, to say nothing of numerous small and shallow mines operated during the year. At these mines there were employed 6,635 miners and 3,483 mill and other outside help or a total of 10,118 men, not including 877 men prospecting.

The machinery in use during the year and partly included in the 327 concentrating and 345 hand jig plants, embrace 860 steam boilers, 574 steam pumps, 102 air compressors, 616 steam hoisters, 390 horse hoisters, 412 crushers, 1,078 steam jigs and 741 hand jigs.

Comparative Statement for Years 1900 and 1901.

	1900.	1901.	Increase.	Decrease.
Counties producing lead and zinc ores	21	24	3	
Number of shafts operated during the year	1,103	895		208
Number of tons lead ore mined during the year	80,478	109.842	29,364	
Number of tons of zinc ore mined during the year	186,296	224,074	37,778	
Amount received for the lead ore product	$3,726,202	$4.849,595	$1,123,393	
Amount received for the zinc ore product	$5,711,631	$5,308,671		$402,960
Total receipts from output of both ores	$9,437,833	*$10,164,230	$726,397	
Average price received for lead ore per ton, all grades	$46 30	$44 15		$2 15
Average price received for zinc ores per ton, all grades	30 65	23 70		6 95
Total number of miners employed	6,688	6,628		60
Total number of mill men and other help	3,282	3,484	202	
Total number of men prospecting	1,613	877		736
Total number of all men employed at mines	11,583	10,989		594
Total number of men fatally injured	52	41		11
Total number of men non-fatally injured	27	24		3
Number of wives made widows	22	19		3
Number of children made fatherless	27	44	17	
Number of tons of ore mined for each fatality	5,130	8,141	3,014	

*Includes nickel and cobalt, $5,964.
The fatal accidents for 1901 were 21 per cent. less than for 1900.
The ore mined shows an increase of 58.75 per cent. per life lost.

MINING LAWS.

The mining laws of our State are in many instances made inoperative, by reason of the fact that we have several different classes of mines that are not in all instances operated or governed alike in their management; conditions are decidedly different, and laws that have been enacted to serve a good purpose in coal mine management are wholly unsuited for lead and zinc mines. Then again, there are other laws that would be of great benefit to all kinds of our mines, but they are so unfortunely worded as to be made apply only to coal mines or the lead and zinc mines exclusively. For an instance take the action of our last Legislature wherein it repealed section 8811, and enacted a new section bearing the same number. In this it completely revolutionized the old code of signals in use at our coal mines for so many years, and so radical was the change that miners, operators and coal mine inspector were compelled to ignore it. Of course to work in violation of law is a very serious matter, but the situation was such as to make it apparent that only the lead and zinc mines were considered in the change. Men are such creatures of habit that it was considered extremely dangerous to permit men who had grown old under the sound of certain signals, and who intuitively obey them, to be made subjects of an inovation so sudden and so different from all former experience. The law should be changed so as to make it applicable to lead and zinc mines only or abolished. There is however a necessity for a code of signals applicable to each one of the two industries, for the very good reason that if each individual mine was permitted to use signals of its own adoption, confusion would result to the miner who changes from one mine to another, and as this is constantly going on, it is best that signals for coal mines should be universally alike. Lead and zinc mines can operate under the present code although some operators and miners object to it, but this would be the case with any system that might be adopted.

Section 8814, having reference to the inspection of boilers and protection around shafts and slope entrances to mines, can be applied only to coal mines, simply because the words "coal mines" are used in the wording of the law. There are no other words in this section which would not prove the entire section a most valuable law applicable alike to coal, lead and zinc mines. The fact is that the requirements relative to the protection around coal shafts, is as much if not a greater necessity for the protection of lead and zinc shafts. Especially is this the case in some of our lead and zinc districts, where great tracts of land are thrown out as a common with numerous roads meandering around hundreds of prospect and mining shafts, some of them very deep, with no sign of warning to say nothing of the absence of a fence. Finding many of the working mines with no protection around the shaft, the inspector had his assistant meet him and for weeks we visited shaft after shaft, notifying the operators that they must fence them in. To the credit of the very great majority of operators they not only complied, but insisted that it was the proper thing to do. A few paid no attention, and upon inquiry of the Attorney-General, found that we had no authority to make the demand. It is a matter demanding most careful attention, and we feel that the great majority of the operators, miners and citizens would welcome legislation of this nature. We do not feel that it is necessary to lengthen this article by a recital of the many like instances, wherein the law could be changed to the decided betterment of conditions in and about our mines. To embrace certain features contained in the law now only applicable to coal mines and eliminate others that have no connection with lead and zinc mines, that are now a part of the general mining laws is greatly to be desired.

No other industry so widely and advantageously advertises this great State as does its mineral industries. Our wonderful resources and rapid advance as a mineral producing State is recognized the world over, while at home it is apparently taken as a matter of course and without, we think, due appreciation.

For the year 1892, just ten years ago, our lead and zinc product sold for $5,556,505, while for the year 1901, the output sold for *$10,164,230, or an increase of 101 per cent. In 1892 there were 5,915 men employed in and about our lead and zinc mines; for the year 1901 there were 10,118 men so employed. There were 600 shafts operated in 1892, and for 1901 nearly 900 shafts without mention of numerous small and shallow shafts. These figures show a very great advance. With this advance, however, the duties of the inspector has multiplied until now he is compelled to state that without further assistance he cannot look after the great number of mines and do them justice. Many mines are not visited at all, and only such mines as are rendered most dangerous and employ the most men, can attention be given to. It must be apparent to all thoughtful men that the inspector cannot do the work that he is called upon to perform. The responsibility for due safety with such an army of men in the mines belongs somewhere, the inspector does not care to assume it and makes the frank admission that he has too much to look after to do it thoroughly. He cannot hope to call the secretary of the bureau, Mr. Marsteller, to his assistance as he had *to do this last* year, as the office work suffers and the report is delayed in consequence; then again, he has the work of the coal mine inspector to look after also. I wish in this connection to thus publicly thank Mr. Marsteller for his great assistance, his faithfulness to myself and the active and intelligent manner in which he has performed his work.

---

* *The figures $10,164,230* embrace in addition lead and zinc values $5,964 as the value of *nickel and cobalt.*

The appointment of a field assistant so that one may constantly engage his time in the Joplin district, while the other looks after the balance of the State, is an absolute necessity.

DIAMOND DRILLING.

Prospecting with the diamond drill is unquestionably the most satisfactory method employed for testing mineral bearing ground of any drill yet devised, as it brings to the surface a part of the material passed through for examination and inspection. This drill is extensively used in the State, but almost exclusively in the Southeast section of it, and principally in St. Francois, Madison and Washington counties, with St. Francois county leading all others decidedly. The very first requirement in diamond drilling is to secure the services of a man who has had years of experience, who is extremely careful and who is a judge of the black diamond. The diamond used in this character of work is very deceptive and it requires a trained and experienced eye to detect and pick the good from the bad; comparatively speaking, it is astonishing how very inferior some of them are, as we have noticed a few that were apparently rotten, while others were found very hard doing good service for years if properly cared for. In our own experience we have found diamonds that would wear slick and with difficulty could be made to take hold of the rock; but fortunately the remedy for this is easy, if the party in charge of the drill is also a diamond setter, as such persons readily discover a condition as above described and will reset the same giving the stone wearing smooth, a turn of about 1-64 of an inch, which gives it a new cutting surface. The diamond that wears slick is not necessarily an inferior stone, but to the contrary, they will be found to be extra good stones. Diamonds are sometimes painted so cleverly as to deceive the best experts and great care is demanded in their selection.

The cost of drilling largely depends upon the formation in which the work is being done, as it is frequently the case, the ground is found to be what miners term open, pockety or cavey; again the formation may prove firm and solid from the surface down; then again, soft places are encountered sandwitched between hard rock; it is in this soft open ground where the diamond driller has his best attention brought into play. The inspector having had years of experience in drilling with, and setting diamond bits, has had experience where the changes in formation in a hole 200 feet deep were so serious as to compel its abandonment; then again the bit would get stuck and sometimes both bit and drill rods would be in same condition; we say stuck because the word is so commonly used when the bit and rods are so tight that the engine, tongs and all the help about the drill fail very often to budge the tools, and have witnessed a twenty-ton jack fail to lift the rods. This kind of work is expensive as there is too much money in the bit and its diamonds to allow them to remain in the drill hole if it is possible to remove them. It is assumed that parties interested in drilling have some idea of the construction of a diamond drill bit, and it will be unnecessary to explain it in detail; the purpose of this article, more particularly, is intended to throw out a few hints gathered from actual experience relative to cost of drilling, and the things to be watched and to be avoided in drilling. It may be well to state that the water that is forced down through the pipe which is connected with the bit is intended to keep the diamonds cool and from burning out; this water after performing this service is forced up through the drill hole and out at the top of the same. The water is colored differently by the different formations through which the drill cuts through, and it is not a difficult matter for the experienced drill man to discover from this water and its color almost always the exact formation the drill is in. So familiar can the careful, experienced drill man become in handling the drill and watching the water forced out of the hole, that he can at once acquaint one with the nature and character of the material being drilled, from both the work of the drill and the color of the water, without the trouble of raising his drill to demonstrate the fact by the core which has been cut; but of course the core is the positive evidence. At times the water that is forced down to the head of the bit is lost, an underground opening or crevice carries it off, then it is the core which must absolutely tell the tale concerning the formation. When the stratification is known to be solid and carries no mineral, what is known as a solid bit or combination bit is used, no core being made; this enables the driller to make much better head way as he can drill right ahead without stopping, while with the core bit he would have to pull up with each ten foot or less of drilling done to remove the core, and if the hole is down several hundred feet it takes considerable time, as the rods have to be unscrewed as they come up and screwed on again when the bit is sent to the bottom. The solid bit cuts the rock as it goes through it as fine as flour and also *indicates the* material in which you are drilling. The top rock, generally speaking, is the most difficult to drill, especially is this true in the slatey or shale formations. Shale has been found to be very hard on both diamonds and the steel in which the diamonds are encased or set, having the effect of rapidly wearing away the steel from about the diamonds and when the diamond is thus exposed it is the more easily broken. A good diamond setter always prefers the steel closed up around the diamonds. In locating a point for sinking a hole, if it is possible so to do without injuring the prospect for mineral, a good supply of water close at hand is the first consideration. Drilling with a diamond bit requires a great deal of water, and if it has to be hauled a great distance the expense for drilling is largely increased; to haul water two or three miles to a drill, as we have seen done, adds greatly to the inconvenience and cost of the work.

The cost of drilling increases with depth; formerly the practice in the Southeast was to pull out when through the lead bearing strata, now the custom is to go to the sandrock. The cost of drilling with the diamond bit depends largely upon location of the work to be done. It cost more for this kind of drilling in Washington county than it does in either St. Francois or Madison counties and of course the cost of diamonds, and the wages of employes and the access to water must always be considered. We have known drill holes that have been sunk 600 feet deep at a cost not greater than (30) thirty cents per foot all told; on the other hand we have known a 600-foot hole to average $1.50 per foot. The inspector knows of a large amount of drilling having been done in St. Francois county for thirty cents per foot, including all expenses and the present high price of diamonds; then again where parties are paying $1.25 per foot. Our impression is, however, that the great majority of this class of drilling especially in St. Francois county, costs the parties owning well equipped drills, furnished with all the necessary facilities for repairs, a good stock of diamonds and a first class drill man and diamond setter, between 40 and 50 cents per foot for a period covering a year. It would be well for those contemplating drilling upon a modest basis to assume not less than 75 cents per foot, and in fact believe the cost in the district will not fall short of that figure. The cost of the wear and tare of diamonds will average about 10 cents per foot. The cost of the diamonds vary in price, but for some years there has been a continual advance. Years ago the inspector remembers when they sold for $7.00 to $10.00 per carat, now the price ranges all the way from $40.00 to $80.00 per carat. That the present prices has a somewhat depressing effect on this kind of drilling we are willing to admit. *We cannot*, however, subscribe to the opinion prevailing with some, that in the near future an invention of some kind will take the place of the black diamond; but with out experience with what is required to grind out a core in some of our rock, the cost of arriving at a substance that will take the place of the present diamond will be so great, durability and other things considered, that there will be no choice from an economical standpoint. We are firmly of the opinion that no substitute for the diamond will be found that will furnish the same amount of satisfaction. Good diamond setters are scarce as it takes a long practical experience to become an expert and competent man in this occupation. St. Francois county can lay claim to some four or five diamond setters of the required experience, some of whom have worked year in and year out at this business alone. It will take a good bit setter from eight to twelve hours to set up one diamond core bit of eight stones; it requires from four to six hours to set four stones in what is known and been explained as a solid bit. I have heard of men who were able to set up a bit like the last one described in from three to four hours, but the inspector knows from experience that it takes for a job well and faithfully done just about the time he has mentioned. Some of our large operators in St. Francois county who own large bodies of minable property, run as many as six and seven diamond drills throughout the year and for years has this been done, until today they can, if so disposed, point out the favored sections which will afford them work for ages to come. The diamond drill hole covers a very small space on the surface of Southeast Missouri; yet who can measure the vast possibilities of what it has already and is now doing in bringing to the light, the immense treasures hidden away in the bowels of the earth, and especially in St. Francois county, where the diamond drill first discovered the great disseminated lead field, noteworthy the world over. The great corporations of St. Francois county, with their many thousand acres of mineral land, could a wondrous tale unfold did they but make public what the diamond drill holes have demonstrated. A faint idea of this may be gathered from the statement that in one year, one company alone drilled what is equivalent to eight miles of drill holes. Drilling in the Southeast is carried on as a rule, anywhere between 350 to 550 feet, the average depth of the ore bodies holding to the first figures in one section while the average in the other section requires the greater depth. Of the several diamond drills in use in the State, we mention the Fisher Patent Drill, the Odgers Drill and the Sullivan. The first named drill is used by the St. Joseph Lead Co., and the Doe Run Lead Co., Mr. C. B. Parsons, Supt., of the St. Joseph Lead Co., having suggested or invented some improvements which have been made in the drill. The Odgers

Drill, was invented by a drill man, and in fact a poor laboring man after long years of hardship and effort. The Sullivan Drill is manufactured by the Sullivan Machine Co. The first named drill is not quite as fast as the last two, but it has the reputation of being much easier on the diamonds.

JASPER COUNTY.

As a zinc producing section this county is so well known and so well advertised by reason of its wonderful output, that one is lost in an effort to say something that has not already been well said concerning it. Mining operations within its borders during the year 1901, have been of such a nature, however, as to make it more and more apparent that one cannot reckon with or forecast its vast possibilities. Prices did not act as a stimulant in adding to the output, for very many mine operators preferred development work to extracting the ore, while others for great lengths of time merely kept the water down until prices proved better. Results show that notwithstanding the unwillingness of some of its largest and strongest operators to push their work; yet the production of the county was far in excess of all previous history.

The zinc mines of Europe are on the down grade and do not meet the demand, as this country has had to supply it by making some heavy shipments. With the activities which must result in Africa, the ever expanding trade of our country, the steady increase of the uses to which zinc is applied and the fact that Jasper county ores are the purest and in greatest demand, are good and sufficient reasons for a stiffening of prices. That the zinc operators of the Joplin district are up-to-date business men, can readily be seen by the manner in which they have maintained prices in opposition to the most powerful influences. The association of operators should embrace every operator in the district and thus make sure of such prices as would pay them all a fair and reasonable return. The signs of the times all point to better prices and the conditions are ripe for it.

In a conversation with Mr. James Roach, of Joplin, a well-known man of extensive practical mining experience, relative to early mining, famous producing places and of the methods employed in extracting and handling the ores of the Joplin district, we learned that shallow mines were worked in Leadville Hollow, near Turkey Creek, prior to the war between the states, and that a small furnace had been erected and operated there for some time. He also informed us that contrary to accepted notions, zinc ore did sell at Joplin in 1876 as high as $17.00 per ton; but that this same ore sold as low as $9.00 and $10.00 per ton in 1870. The ore at the time was first-class, being found in spar and mud, with some lead; the necessary crushing being done on a flat rock elevated about 2½ feet above the ground with what was known as a buck hammer. Mr. Roach worked as far back as 1876 on Joplin Creek, about one mile from town, on the Granby land. In the early days Kansas City Bottom was a favorite locality, he having witnessed between 500 and 600 men at one time at work in the shallow mines. The miner and prospector at that time made considerable money, as an average of 15,000 pounds was mined per week, with one man at the windlass, two men washing and six men in the ground. At that time, in addition to Kansas City Bottom, Lone Elm, on what is now known as the Porter lands, at a point where the P. & G. depot stands, was quite famous, as was also Swindle Hill. The Grand Hope was a mine that was worked from within a few feet of the surface to 110 feet in lead, and for a long time made an average of 100,000 pounds of lead weekly. Shallow mines were worked all the way up Joplin Creek Hollow to Parrs Hill.

In those early days even the horse hoister was seldom found in use, the windlass being used almost exclusively. There was what was called a whim, that was used before the horse hoister—the parts consisting of a wooden drum fastened to a stem, on which a swapp was attached, and the horse hitched to this; the brake used was made up of a few pieces of board, which was pressed up against the bottom by a hand lever. No steam hoisters were in use until 1876, and only one for a long time; this steam hoister was the property of or used by Black Cursen. From 1876 on, the horse hoister, however, came into very general use. During the early days the individual miner and small operator did no pumping, except in very shallow ground; the land owners did the pumping, machinery at that time being out of the reach of the miner or small operator. Some of the very best mines in the Joplin district have been opened up and developed since 1895, especially is this true of that territory embraced in and from Leadville Hollow to and including Chitwood Hollow. While this is an exceedingly fine mining district, embracing within its limits some of the best producers the Southwest Missouri district can boast of; yet there is to consider in connection with this statement, the fact that many advantages in the way of very superior facilities and the most improved and modern machinery, both for the rapid and economic extraction and handling of the ores, have been in use of late years compared with the crude methods and appliances in use formerly. Large plants handling great quantities of material, supplied as they now are with the best machinery, are able to make money out of ore running so low a percentage as it would not have been possible for the small operator some time ago to live on.

Mr. Roach further said that his experience in the mines of the Joplin district, impressed him with the fact that after reaching a certain level or to that point termed by miners "bed rock" (meaning by that the heavy flint rock) that this rock will be found after it is penetrated some distance, to be fractured, and that these fractures are filled with ore; that such formations have a tendency to change the ore bodies, or that the ore is found in something more like blanket veins than in channels.

Heretofore the custom has been to write up the mines of this county under the head of the Joplin, Carterville, Webb City, Oronogo and Carthage districts; but as there are now a number of large companies owning property and operating mines in several of the districts, it is difficult to fully describe the operations of such companies in each camp without confusion. We will therefore endeavor to make a statement concerning each company in the county, giving credit to the respective localities for all that may be due them, in tables, which it is hoped will give due credit to the respective camps.

AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This is one of the largest companies operating in Southwest Missouri, and aside from the Granby owns and controls more mining property than any other company in the Joplin district. It was incorporated under the laws of the state of Maine, with an authorized capital of $2,500,000, but whether stock has been issued for the full amount we are unable to state. The head office is located in Boston, Mass., and its general office at Carterville, Missouri. The officers of the company are: Richard A. Parker, President; F. W. Batchelder, Secretary; Edward P. Brown, Treasurer; William C. Renfrow, Resident Director, and William B. Fisher, General Manager.

The organization was affected during the winter of 1899, and by August, 1900, it had acquired the fee to 2,300 acres of land and a lease on 1,700 acres additional, making a total of 4,000 acres of very valuable mineral land under its control. During the first year of the company's existence it owned and operated ten mills, numerous mines and pumping plants; since then, however, like most of the other large holders of mining lands, it has changed its policy, and no longer mines ore on its own account, but does a purely leasing business. It owns and operates ten pumping plants with capacities ranging from 100 gallons to 1,000 gallons per minute, with which it drains the land on which its lessees are at work.

There are in the aggregate thirty mills and fifty hand jig plants on this property, and there are at least 100 lessees on the property mining and prospecting, who are not yet treating the ore for themselves. The American Zinc, Lead and Smelting Co. has produced during the year 11.45 per cent, of the zinc ore output of Jasper county, which places it second in the list of producers.

This company has divided its property into tracts, known as follows:

Center Valley tract, one mile south of Oronogo.
Cornfield tract, at Carterville.
Davy tract, at Carterville.
Interurban tract, two miles west of Joplin.
Lone Lady tract, two miles west of Joplin.
Midway tract, midway between Joplin and Carterville.
Missouri Central tract, three miles west of Joplin.
Porter tract, west of Joplin.
Richland tract, at Carterville.

The Center Valley tract contains 120 acres of mining land, located about one mile south of Oronogo. There are seven concentrating plants, five hand jig plants, 12 mines actively producing with an average of 150 in depth, 20 steam boilers, seven steam pumps, four air compressors, 15 steam hoisters, 12 horse hoisters, seven crushers, 16 steam jigs, 10 hand jigs, with an average of 150 miners and 25 other help employed, and 20 men prospecting on the tract.

The output for the year amounted to 7,494,000 pounds of zinc and 564,640 pounds of lead, and the receipts from the sale of the ore was $98,600.00. The following companies have been operating on this tract: New Jersey Mining Co., State Lead and Zinc Co., (successors to the Verona Mining Co.) Blue Bell Mining Co., Shawmut Mining Co., Silver Dick No. 2, Mellville Mining Co., Inglewood Mining Co., Silver Moon Mining Co., Pansey Mining Co., Owens Mining Co., C. A. Parker Mining Co., Patten Mining Co., Hendrix & Stultz Mining Companies.

The Blue Bell Mining Co. operates six lots on this tract. Mr. J. J. McClellan is its superintendent, with Box 583, Webb City, Mo., as his postoffice address.

The State Lead and Zinc Co. owns a lease of four acres on this tract. Mr. B. M. Jennings is superintendent, and his postoffice address is 2117 Pearl St., Joplin, Mo. This company succeeds the Verona Mining Co.

CORNFIELD TRACT OF THE AMERICAN ZINC, LEAD AND SMELTING CO.

This tract of land is located in the S. E. quarter of the S. E. quarter of section 17, and the N. E. quarter of the N. E. quarter of section 20, township 28, R. 32, embracing about 80 acres. There are 10 concen trating plants, two hand jig plants and 12 mines actually producing ore. The shafts average about 180 feet in depth. The equipment consists of 16 boilers, two pumps, eight air compressors, 11 steam hoisters, one horse hoister, 10 crushers, 20 steam jigs and seven hand jigs. On this tract 200 miners and 50 other employes have worked on an average of 250 days for the past year. The product from this property in zinc ore was 19,856,000 pounds and 3,538,350 pounds of lead ore, which sold for $304,390.78.

The sub-lessees on this ground are as follows: Bell "C" Mining Co., Cass & Moore Mining Co., New Century Mining Co., Leon Cass Mining Co., Myrtle D. Mining Co., 5 Chums Mining Co., Big Hit Mining Co., J. H. Cook Mining Co., the Granite Mining Co., Jones & Co. and Dorn & Co.

This tract has been supplied with excellent water facilities by the company. An 800-foot drilled well supplies all water for domestic as well as for milling purposes; a tank 50 feet high has been constructed with a capacity of 12,000 gallons, the water being forced from the well by compressed air. The Cornfield tract, compared by acreage, furnishes a larger product than any tract belonging to the company, due in a measure to the sheet formation of the ore, but more particularly to the class of men operating the several mines, as each plant has an experienced miner as a partner in the concern.

The Lu Lu D. Mining Co., having a lease on six acres on this tract, produced during the year 2,914,000 pounds of zinc ore and 40,220 pounds of lead ore during the year. Messrs. J. A. Daugherty, T. J. Moore, J. B. Moore, W. H. Carl and J. A. Bowman are owners of this lease and plant.

THE DAVEY TRACT OF THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This tract is located in the N. W. quarter of the N. E. quarter of section 21, township 28, R. 32. The company owns the 40 acres composing the tract on which the Missouri Blanket Vein Zinc Co. and the Eastern Star Mining Co. are operating.

The Missouri Blanket Vein Zinc Co. operates two mines in the Third ward at Carterville, the ore being reached at a depth of 235 feet. The equipment consists of concentrating plant, four boilers, two pumps, two air compressors, two steam hoisters, crusher and five steam jigs. The output of zinc for the year was 2,548,000 pounds and 749,084 pounds of lead, which sold for $46,418.00.

The two large shafts operated by this company reach the ore below the 200-foot level and give promise of a large production.

The Eastern Star Mining Co., has a lease of 40 acres on the Davey tract and operates two mines. It has a complete concentrating equipment and all necessary machinery to handle the product of its two shafts. The production was 1,700,000 pounds of zinc and 565,000 pounds of lead, which sold for $33,841.22, this is one of the deepest producing mines in the district.

THE INTERURBAN TRACT OF THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This tract embraces 40 acres in section 7, township 27, range 33. There are seven leases on the tract as follows:
embraces 40 acres in section 7, township 27, range 33. There are seven leases on the tract as follows:

J. W. Brooks with 2 shafts; Quality Ridge, 1 shaft; Margurette, 2 shafts; American, Jr., 2 shafts; Yellow Rose, 2 shafts; Webb & Co., 1 shaft; and Ricksucker, 1 shaft. Only three shafts are so far producing ore, with an average depth of 80 feet for each.

THE LONE LADY TRACT ON THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This property, contains 20 acres in the N. W. quarter of the S. W. quarter of section 7, township 27, range, 33. The plant and equipment consists of a custom mill, 3 boilers, 4 pumps, 2 steam hoisters, 4 horse hoisters, 1 crusher and 2 steam jigs. There are 4 shafts of an average depth of 80 feet and each producing ore. The following lessees are at work on the tract:

Britton Mine, 1 shaft; Pickett No. 1 and No. 2, 2 shafts; Thanksgiving, 1 shaft; Tennessee, 1 shaft; Texas, 1 shaft, and St. Louis, 1 shaft.

All ores mined on this tract, the Interurban and the Porter tract are cleaned on the New Jersey custom mill located on this ground.

MIDWAY TRACT OF THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This tract contains 60 acres in section 31, township 28, range 32 and section 6, township 27, range 32, the land being owned by the American Zinc, Lead and Smelting Co. The equipment is made of 2 concentrating plants, 4 hand jig plants, 5 boilers, 4 pumps, 5 steam hoisters, 6 horse hoisters, 2 crushers, 4 steam jigs and 10 hand jigs. There are six producing mines with shafts that run from 80 to 140 feet in depth.

The product for the year was 5,732,000 pounds of zinc, 71,000 pounds of silicate and 104,380 pounds of lead, which sold for $66,-201.92.

On this tract the following companies are at work: Dividend Mining Co., 3 shafts; Lone Tree Mining Co., 1 shaft; Shade Mining Co., 1 shaft; Great Bend Mining Co., 1 shaft; Black Haw Mining Co., 1 shaft; Sasafras, 1 shaft, and the Four to One Mining Co., 1 shaft.

This tract of land has been neglected, but from present indications promises good turn-ins for the current year. Two additional plants are in process of erection, and with four concentrators running, an output of 2,000,000 pounds per month is looked for by the management. The ground runs from soft to medium and is easily and cheaply worked. This property lies midway between Webb City and Joplin with two railroads passing through it, offering fine inducements to the prospector.

The Dividend Mining Co., located on this tract has a lease of 10 acres and operated one mine during the past year. It has a concentrating plant complete, and all the needed machinery and equipment to do a large business. The output from this company was 3,084,000 pounds of zinc, 34,000 pounds of silicate, 3,000 pounds of lead, valued at $38,500. This company experienced a disastrous cave in last year from some of its old workings, necessitating the rebuilding of its mill. One new shaft was sunk and another shaft carried 50 feet deeper, a new tramway and several new buildings were also constructed during the year. Mr. C. D. Pratt is general manager of the company with postoffice address, box 813 Joplin, Mo.

The Sassafras Mining Co., located on this tract is composed of Messrs. Jarrett, Bell and Beeman. The company has one shaft down and operated at 125-foot level, with an equipment embracing a concentrating plant, 3 boilers, 3 pumps, 2 steam hoisters, 1 crusher and 2 nine cell steam jigs. Most of the plant has been put in during the year. There were 496,000 pounds of zinc and 2,820 pounds of lead produced since its plant was placed in running order.

MISSOURI CENTRAL TRACT OF THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This tract embraces 56 acres in section 6, township 27, range 33. The lessees on this tract are as follows:

Clover Leaf Mining Co., July Mining Co., Cox & Leonard, F. L. Cox, Bayliss Mining Co., and McBride Mining Co., there being 7 shafts sunk or in process of sinking by the above named. This ground was *not worked* extensively during the year owing to the amount of water *encountered; preparations* have been made to sink and drain the 140-

foot level as rich bodies ot ore have been demonstrated by the drill below the 100-foot level. A 10-inch lift pump run by a 20-horse power gasoline engine has just been installed.

PORTER TRACT OPERATED AND OWNED BY THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This tract is located in section 7, township 27 and range 33, and Smelting Co., is located in section 7, township 27 and range 33, and embraces 20 acres. Dodson & Co., J. W. Schenck, J. W. Brown, E. R. Martin and W. W. Gregg each have two shafts averaging from 7 to 50 feet in depth, the work so far having been confined to shallow digging. Water has been the draw-back so far, but the company contemplates sinking a pump shaft to the 150-foot level, when good bodies of ore that have been proven to exist will be worked.

THE RICHLAND TRACT OF 30 ACRES, OWNED BY THE AMERICAN ZINC, LEAD AND SMELTING COMPANY.

This tract is located in the S. W. quarter of N. E. quarter of section 21, township 28, range 32. The lessees on this tract are the Margurite Mining Co., Richland No. 1, Richland No. 2 and Wilkie & Elliott. Four shafts are operated and the ore found at the 175-foot level. The equipment consists of two concentrating plants, two hand jig plants, four boilers; one steam pump, two air compressors, three steam hoists, two horse hoists, two crushers, four steam jigs, four hand jigs. There were 1,418,000 pounds of zinc and 567,000 pounds of lead produced during the year.

The several tracts owned or controlled by the American Zinc, Lead and Smelting Co., and the value of the production from each for the year is as follows:

Center Valley Tract	$98,602 00
Cornfield Tract	304,390 78
Davey Tract	80,259 29
Interurban Tract	14,076 01
Lone Lady Tract	3,641 78
Midway Tract	66,201 92
Missouri Central Tract	2.889 02
Porter Tract	2,694 65
Richland Tract	29,441 00
	$602,196 45

THE AIDA MINING COMPANY.

This company is composed of Chicago gentlemen, and it owns a lease on five properties in the county. Aida No. 1 is on a 20-acre lease, owned by Mrs. Cosgrove, 10 acres of which is controlled by the Aida; shaft, 240 feet deep. The equipment consists of a 100-ton mill, complete in every way, boiler, pump, steam hoister, crusher and two steam jigs. 2,610,000 pounds of zinc ore and 76,000 pounds of lead ore was produced during the year. The mine is located about 3½ miles southeast of Webb City.. The output of the remaining properties belonging to this Company is covered by the parties owning the property on which their leases are located.

Aida No. 2 is on the McKinley lease of the Conner ground.

Aida No. 3 embraces a lease of 40 acres on the Chew land, and as it is an excellent company, much may be expected from it as a producer. This tract is near Duenweg and northwest from the Big Six.

Aida No. 4 and Aida No. 5 are both located on the Granby land at Oronogo.

Mr. Harry Gundling is President, George S. Lord of Chicago Secretary and Treasurer, H. H. Lord of Webb City Manager and Thos. Coyne of Webb City Superintendent.

BAILEY & STICKNEY.

This is a new company under an old name, work under the new conditions, having commenced during the month of January, 1901. The land, a part of which under the ownership of Mr. Stickney, comprises 200 acres, located four miles northwest of Joplin. Only one shaft was operated during the year, and this at a depth of 140 feet, the work being prospect work simply. The company has put in a pump, platted the land into mining lots, and have let the same to miners to prospect and develop in the usual way. Part of the land is owned by the company and the balance held under long time lease. Since December 1st, 1901, quite a number of leases have been made.

BARBEE & YALE.

This company controls a lease of 40 acres in the southeast quarter of section 33, township 28, range 33. They have $10,000 invested in equipment, which embraces a complete concentrating plant, one hand jig plant, three boilers, four pumps, three steam hoisters, one horse hoister, two crushers, two steam jigs and five hand jigs. The output for the year was 240,000 pounds of zinc and 433,340 pounds of lead ore.

BAY STATE ZINC MINING COMPANY.

This company is incorporated under the laws of Massachusetts, and has a lease on 48 lots, a part located on the Granby land, John Jackson Investment Co. land, and at Belleville. Three shafts were operated during the year, which vary in depth from 80 to 170 feet. There are two concentrating plants, two hand jig plants, five boilers, three pumps, four steam hoisters, one crusher and one pair steam jigs on the property. The product from the mines of this company aggregate 1,574,000 pounds of zinc and 543,570 pounds of lead ore and sold for $30,218.57. Drilling, sinking shafts and drifting has been industriously carried on throughout the year.

BECKWITH-HALL MINING COMPANY.

This company, composed of Carthage parties, owns the lease of 40 acres, located about one mile south of Carterville, and has sub-leased to the Richmond Mining Company, and the Opal Wonder Mining Company.

The Richmond Mining Company has a lease of four acres on the above-named property, on which there is a shaft down to the 200-foot level. $10,000 is invested in its equipment, which embraces a concentrating plant and machinery necessary to conduct its business. The output of the company for the year amounted to 1,200,000 pounds of zinc ore and 50,000 pounds of lead ore.

The Opal Wonder Mining Company also has a lease on the above-named property, of about ten acres, on which it has a shaft down 155 feet. The equipment is valued at $6,000, consists of a concentrating plant, boilers, air compressor, steam hoist, crusher and steam jigs. The output of 400,000 pounds of zinc ore and 200,000 pounds of lead ore sold for $8,400.

BIG SIX DEVELOPMENT COMPANY.

This property consists of 40 acres in the S. E. of N. E. quarter of section 4, township 27, range 32, Jasper county, Mo. The land was entered by Mr. Mitchell in 1856. Mr. Mitchell and wife, who lived in Pennsylvania, came by boat to Jefferson City, and across the country to this locality, and entered this with other lands.

The ground has never been plowed, but is in the virgin prairie grass, they having paid the taxes on it all these years. In 1898 the Big Six Mining Company leased the 40 acres and commenced the ordinary drilling and prospecting for lead and zinc. About February 1st, 1901, they came to the ore in the discovery shaft at 173 feet.

The shaft was sunk to about 200 feet and a little prospecting by drilling was done when it was determined that the deposit was an extra good one, and would justify building a mill at once. A 100-ton mill was built, and in operation by the middle of May. During the first 22 weeks this one mill was operated; the average output was 99 tons per week from one shaft, and during one run of 10 shifts it produced 197 tons. There are now two more mills in course of construction at shafts which have equally flattering prospects.

The Big Six, at present does not mine, but subleases to the following companies:

W. D. & W. Mining Co., Fairview Mining Co. and the Red Bud Mining Co.

The W. D. & W. has a lease of four mining lots and a shaft down to the 175-foot level. Work was commenced in this mine in August and at the end of the year was only fairly opened up. The output was 328,000 pounds of zinc ore and 3,460 pounds of lead ore. C. T. Williams, Supt.

The Fairview Mining Co. has a sublease on 6 lots and one shaft down to the 200-foot level. The equipment consists of a concentrating plant, two boilers, two pumps, two steam hoisters, one crusher and two steam jigs. This mine was opened up in the month of May. Output, 4,511,000 pounds of zinc ore and 22,250 pounds of lead ore. H. U. Dale, Supt.

BOSTON GET THERE ZINC COMPANY.

This company is incorporated and composed of Eastern capitalists. W. Spencer Hutchison, with postoffice, at Carthge, Mo., is Superintendent. The property embraces a 40-acre lease at a royalty of 8¾ per cent. This land is located at Prosperity and adjoins the Eleventh Hour and Troup mines. The ground produces both lead and zinc, and because of its excellent roof and hardness of the material excavated admits of wide drifts. The yearly output as per following table shows this to have been a good producing property and while the past year shows a decrease, yet it is to be hoped this, like other properties, surrounding it, may take on a new life.

The following tabulated statement shows the yearly production and money value of the lease since 1893:

	Lead, lbs.	Zinc, lbs.	Value.
1893	264,430	364,530	$8,776 30
1894	328,900	150,570	6,816 24
1895	1,382,240	838,020	32,449 88
1896	4,230,550	3,278,800	91,612 63
1897	3,457,560	3,179,600	81,984 43
1898	3,555,570	4,425,140	120,003 31
1899	1,614,520	8,108,000	170,872 00
1900	1,877,000	9,277,000	205,771 00
1901	754,400	3,771,030	60,200 00
	17,458,170	33,392,690	$778,505 79

The lesees on this property are the Atlas Mining Co., J. W. Ground of Carthage, Mo., President. The John Morton Mining Co., W. E. Patton of Webb City, Superintendent; Batavia Mining Co., J. W. Ground of Carthage, Superintendent. J. C. Squires of Carterville, Mo., has a sublease from the Batavia. Three shafts, with depths from 165 to 180 feet, were operated during the year. The equipment on the land consists of three concentrating plants, four boilers, three pumps, three air compressors, three steam hoisters, three crushers and three steam jigs.

BOSTON-DUENWEG COMPANY.

This company is incorporated under the laws of Rhode Island, and it owns the fee to 155 acres located at Duenweg, formerly konwn as the Ground and Irwin land. This property has been a wonderful producer of both lead and zinc ores, and averaged for a long time a weekly output of 200 tons of zinc and 30,000 pounds of lead. This property was originally developed by G. P. Ashcraft of Webb City, Mo., who had a phenominal run of lead ore. The ore bodies heretofore encountered were at depths ranging from 100 to 150 feet from the surface; largely the ore was found in soft ground, requiring much timber, while other sections showed hard ground where timbering was necessary.

The land belonging to this company is described as to location as follows:

The north half of the northwest quarter of section 10, township 27, range 32, and the south half of the southwest quarter of section 3, township 27, range 32. The following detailed statement of the operations of the company through its lessees for the year ending December, 31st, 1901, has been furnished by Mr. W. R. Crandall, Superintendent of the company.

Mill.	Operator.	Zinc, lbs.	Av. price.	Value.	Lead, lbs.	Av. price.	Value.
East End....	Brown & Co.	539,680	$20 40	$5,606 61	6,880	$22 84	$157 15
West End....	Allen & Co...	1,015,240	23 90	12,135 22	26,240	22 87	600 19
Newsboy	H. U. Dale..	123,730	8 81	545 09	279,060	22 81	6,365 73
Baptist......	Carrick & Co.	117,750	14 03	826 34	1,870	22 81	42 58
Total......	....	1,796,400	....	$19,113 26	314,050	....	$7,165 62

MISCELLANEOUS PRODUCTION FROM "SHALLOW WORKS."

	Pounds.	Average.	Value.
Zinc ores......................	77,980	$15 82	$686 73
Silicate......................	62,735	11 67	366 23
	140,715	....	$982 96
Lead ores......................	485,450	$22 85	$11,090 55
Dry bone......................	257,350	12 74	3,279 43
	742,800	....	$14,369 98

SUMMARY.

	Pounds.	Value.
Zinc ores......................	1,337,115	$20,096 22
Lead ores......................	1,056,850	21,535 60
	2,993,965	$41,631 82

The parties operating on this property are almost without exception co-operative miners. During the year the company operated but one mill and this only for a period of three months; this was what is known as the "West End Mill." The East End Mill belongs to the company, but the "News Boy" and "Baptist" are owned by other parties.

There is quite an area on this property classed as "Shallow Diggins," the operations of which have been placed as above, under the head of miscellaneous, where small shafts and the windless under the charge of individaul miners secure the ore. The splendid developments of late made in the neighborhood of this property, should greatly encourage its owners.

BOQUA MINING COMPANY.

Mr. A. E. Boqua, the Superintendent, with others, own a lease of *70 acres on the* Norton land one mile west of Joplin, on which there are four shafts, ranging in depth from 130 to 196 feet. The ore is in hard ground, requiring but very little timber, the output for the year being 2,988,000 pounds of zinc ore and 6,010 pounds of lead ore. There are at present four companies operating on the property. The Audrain Mining Co., the Warren Mining Co., B. & C. Mining Co. and the Vestal Mining Co. There are two complete mills on the property, three hand-jig plants, six boilers, four pumps, one air compressor, five steam hoisters, four crushers, six steam and four hand jigs. With the prospect presented on this tract, at the close of the year there is every indication of an increased production for the current year.

BRADFORD-KANSAS CITY MINING COMPANY.

This company purchased the holdings of the Garden City Lead & Zinc Mining Co., June 1st, 1901. The mine remaining idle from time of purchase until January 1st, 1902, at which time work was again commenced. Mr. Aaron Shubart is its Vice-President and General Manager, with postoffice at Webb City, Mo. This 40-acre tract is in the northwest quarter of section 17, township 28, range 32, northeast of Webb City. During the year one shaft, 115 feet deep was operated. The equipment embraces one concentrating plant, two boilers, two pumps, one steam hoister, one crusher and two steam jigs. The output from Jaunary, 1901, to June 1st, 1901, was 608,000 pounds of zinc ore and 61,080 pounds of lead ore.

BURGNER MINING COMPANY.

This company is composed of J. M. Burgner and J. A. Bowman of Carterville, Mo. It controls 80 acres, being the east half of the northeast quarter of section 28, township 28, range 32, bordering the city limits of Carterville on the west. Two new and complete mills have been erected, but too late to be of use during the year just closed; the same may be said of two new boilers, two pumps, two crushers, four steam jigs and three steam hoisters; previously three horse hoisters and three hand jigs covered the equipment.

The output during the year showed up 366,955 pounds of zinc ore and 314,530 pounds of lead. The indications all point to this becoming an excellent producer and particuarly in lead ore, which shows an unusually large percentage of the output.

BUNCO MINING COMPANY.

This company owns a lease of 29 acres, being a part of the southwest quarter of the northwest quarter of section 2, township 27, range

34, at Cave Springs. The royalty stands the company 10 per cent on all mineral mined. There are four producing shafts on the property, ranging in depth from 70 to 106 feet. The output for the year was 808,605 pounds of zinc ore and 221,818 pounds of lead ore, which sold for $14,808. The equipment consists of one hand jig plant, two boilers, three steam hoisters, one horse hoister and ten hand jigs. The companies operting on the land are Bruna & Co., Hudson & Co. and Hutsell & Co., W. P. Howard is General Superintendent for the company.

CENTER CREEK MINING COMPANY.

This company has the distinction of owning the land upon which the first zinc ore was discovered in the district; this was in 1875, and mines opened up in that and the following year have continued in operation ever since.

The Center Creek Mining Company was organized in 1877, and its present capital stock is given as $1,239,151.70. Its officers are J. C. Stewart of Webb City, Mo., President; F. M. Hammet of St. Louis, Mo., Vice-President, and W. C. Stewart, Secretary and Treasurer. The company owns in fee simple 200 acres of mineral land in and around Webb City, much of the land being located between Webb City and Carterville, the production from the same having been immense, as may be seen from the tables following. The ground has been worked successfully at from 40 to 80 feet from the surface, and from 140 to the 170-foot level. The ore occurs mostly in flint ground and is mined in numerous places to a heighth of 80 feet. An illustration of the great depth and body of the ore is found in the Beasley shaft on this property, which has been worked for about 20 years. This shaft is 150 feet deep and the drift from the same has been driven 200 feet in length, 100 feet wide and 80 feet from top to bottom, without timbering, with a production from the one shaft of $550,000.

When the company organized it platted its land into lots 200x200 feet and then leased to miners. Since 1877 about 130 shafts have been sunk, at least one-half of which have been worked profitably. This property was originally owned by Mr. John C. Webb, and farmed by him unconscious of the hidden treasures beneath the surface, which he had been working, until his plow brought to light a bright and glittering substance which, while it attracted his attention, was as yet unknown to him in its nature and value. A tramp called at Mr. Webb's house and asked for dinner. During the repast which was set before him it developed that he had been mining in the West, and at once Mr. Webb seized the opportunity to learn what it was that he might possess. The old miner at once recognized it as lead and gave an idea of its value;

this was followed by an agreement between Mr. Webb and the tramp, whereby the tramp would do the work of prospecting and Mr. Webb furnish the tools, they to share and share alike in the profits. This venture resulted, as many hundred have since, in nearly every county in the State south of the Missouri river, and the fact that water stopped them at 35 feet lost to this old miner a fortune. The miner traded his interest to a Mr. Daugherty for $25.00, who purchased a horse-power pump and succeeded in reaching a depth of 80 feet, when he in turn was forced out by the water. This experience so discouraged Mr. Webb that he sold his interest to Mr. G. P. Ashcraft, who was prevailed upon by Mr. Daugherty to try a drift in the shaft at the 35-foot level. The very first shot developed a pocket of lead 50 feet long, from which was removed in four days 18,000 pounds of lead. Here was a fortune lost by a foot, but there are many miners in the State today who, if within a foot of a deposit of lead would more than likely detect pointers that would lead them to drifting as it did Daugherty. At this early date in our mining history, particularly in the southwest, lead ore only was considered of commercial value, the zinc or "jack," as it was called, was cast aside as worthless, and in fact the lead ore being mined only in shallow shafts, the presence of zinc carried with it a discouraging impression and to many indicated the pinching out of the lead deposit. Except where the ground was open or in the boulder formation, no attempt was made to penetrate the underlying strata of lime rock and not until a value was placed upon zinc ore was the heavy cap rock which forms such splendid roof for the mines on the property passed through in the pursuit of mineral. The years of largest production was 1889, 1890 and 1891, when the yearly output hovered close to the half million dollar figures. The company, while it has done considerable mining on its own account, yet the major part of the work has been done by lessees, the company, however, furnishing the pumping facilities to a great extent, its plant in this respect being unexcelled by that of any plant in the district. It is not to be wondered at that miners and men seeking mining property should prefer a locality where good mines are known to exist; but is to be wondered at that some miners are so facinated with the Center Creek ground that they persist in working in the caved-in abandoned shafts, when so much safer and better ground is open at other places. This fact was forcibly brought to the attention of the Inspector and his assistant last fall while making an inspection of the Center Creek property. Noticing a large cave-in near the depot at Webb City, we concluded to investigate it and had not been so engaged very long until we arrived at the shaft which lead to the mine when the same was intact and in good working order. This shaft from the surface down for some 20 feet was in fair shape; but upon looking down the same we saw a sight that at first glance looked horrifying. The cave-in had carried with it all of three sides of the shaft for about 100 feet, and the material about the shaft hung from top to bottom in ragged, ugly blocks or rock, some of which twenty feet square projected into space in a most threatening manner, and under all of this dangerous looking material we espied three men at work. We decided the place too dangerous to work in and walked around to the farther side of the cave-in, where it was noticed a path lead down along the cave-in material to a point about thirty feet above the place where the men were at work. At this point we shouted to the men at work: "Are you trying to commit suicide?" "No," said one of them, "come down and see for yourself;" we replied that we could see enough to satisfy us the place was not fit to work in and explaining to them our business suggested that they suspend further work in a place that was evidently a very dangerous one. With this the spokesman approached us pleading the temporary safety of the place, but admitting that it might not be safe very long and suggested another point where some men were at work, which, while not looking so dangerous, was in fact more dangerous. This man was thoroughly posted in his work and anxious to get out some ore in sight, and with the promise to follow certain directions and leave the place, it was agreed that they should continue until the ore was secured. This party informed us that he paid a royalty of 50 and 5 per cent on the ore taken out, he being a sub-lessee.

There were during the year 35 shafts operated on the land, ranging from 100 to 170 feet in depth. The equipment consists of twelve concentrating plants, twenty boilers, five steam pumps, two air compressors, sixteen steam hoisters, six horse hoisters, thirteen crushers and two hand jig plants. The following parties are operating on the land: C. A. Parker, New Jersey Zinc Co., Center Creek Co. (four shafts) Lytle & Co., D. C. McConey, Smith & Holcomb, Beasley & Co., Commoner Zinc Co., Atterberry Bros., Harlan, Julian, Gray Eagle, Woodsum, Brown & Allen, Reynolds & Co., Hatten & Co., Wolf & Co., Somerville, W. H. Smith, Hood & Co., Wyatt & Co., Frandel & Co., Bell & Co., Jno. Haines, Sayler & Co., Harlan & Moody, Isaac Perkins and James & Co.

The following table shows the value of the output of the Center Creek Mining Co., from 1881 to 1886, inclusive, as taken from the books of the company and prior to the gathering of statistics by the mine Inspectors:

	Lead.	Zinc.	Total value.
1881	10,812	164,892	$175,704
1882	18,750	204,738	223,488
1883	13,600	145,231	158,831
1884	12,500	184,711	197,211
1885	25,000	186,600	211,600
1886	45,280	296,167	341,447
	$125,942	$1,182,339	$1,308,281

Since 1886 the State has gathered statistics, which show the output to date as per following table:

	Lead. lbs.	Zinc, lbs.	Value.
1887	2,236,720	30,209,100	$356,045 25
1888	1,902,520	27,477,520	370,531 69
1889	2,805,580	37,969,520	526,511 13
1890	2,593,970	44,685,090	593,475 40
1891	1,760,120	33,539,950	403,798 74
1892	1,910,880	23,547,880	296,002 84
1893	1,223,720	19,486,330	204,694 37
1894	1,655,610	22,251,620	210,324 87
1895	882,650	18,848,750	191,408 46
1896	590,960	10,423,490	105,273 55
1897	756,710	10,530,500	106,750 61
1898	836,000	11,902,000	146,915 00
1899	994,880	12,698,000	228,896 31
1900	1,372,000	13,830,000	230,373 00
*Last six months 1900	858,020	6,672,000	92,728 00
1901	1,308,130	15,114,000	188,672 00
	23,628,470	339,455,750	$4,261,402 22

*For the years 1886 to 1900, inclusive productions was accounted for in fiscal years ending June 30, the Legislature changed the time for gathering statistics and the six months referred to evens out the years.

Taking the values as found in the two tables above we have a total valuation for the two ores from 1881 to 1901, inclusive, of $5,569,683, or five times the capital stock of the company. When it is remembered that this company has received a royalty of from 20 to 50 per cent some idea of the immense profits received may be had.

CONSOLIDATED ZINC & LEAD COMPANY.

This company, while owning the fee to 331 acres of land has not yet prospected it; its work being confined to lands leased from other companies, of which there are 27 acres controlled by the Consolidated, located in the south 1-2 of northwest of the northeast quarter of section 18, township 27, range 32, and 7 lots in east 1-2 of the northwest of the southeast quarter of section 32, township 28, range 33. There are a number of sub-lessees on the two leases held by the company, as follows:

Malone, Cutter, Zinn & Rubaugh, 2 shafts; Gill, Nelson & Blake, 2 shafts; J. E.—W. and C. H. Lane, 1 shaft; Matthews, Flock, Miller, Doyle & Sweet, 2 shafts; Kruger, Cutter, Miller, Rosenberg & Perry, 1 shaft; McManamy, Sowder & Pierson, 1 shaft; Stone, A. H. & F. Holden, F. M. and J. W. & W. W. Clark, 3 shafts.

Twelve shafts were operated during the year, which ranged in depth all the way from 45 to 136 feet. The production embraced 632,000 pounds of zinc ore, 50,000 pounds of silicate, 702,225 pounds of lead and 64,270 pounds of dry bone. One concentrating and six jig plants, two boilers, two pumps, two steam and seven horse hoisters and one crusher were made use of during the year.

CONKEY INDEPENDENT LEASE.

This lease embraces 40 acres of land at Webb City, and is under the management of Mr. M. C. Conkey of Carthage, Mo. This was formerly the Portland, which made the only production of the year, 115,160 pounds of zinc ore. The present company has made no output, confining its operations to the sinking of the shaft to a lower level and driving drifts. The shaft is down nearly 300 feet and it is to be hoped that a rich body of ore will be developed without too much water to contend with.

COLORADO-JOPLIN MINING COMPANY.

This company is incorporated under the laws of Colorado, and owns the fee of 70 acres, located 2 1-2 miles north of Joplin, in what is known as the "Tuckahoe District." There are seven shafts on the property having an average depth of 130 feet. At present Mr. S. T. Nesbett controls the greater part of the ground under lease from the company. The equipment consists of four boilers, two pumps, four steam hoisters, two horse hoisters and fourteen hand jigs. The production for the year amounted to 350,000 pounds of zinc ore and 95,000 pounds of lead.

CONTINENTAL ZINC & LEAD MINING & SMELTING COMPANY.

This company is organized under the laws of the State of New Jersey, with an authorized capital stock of $750,000 in 150,000 shares of $5.00 par value, of which $550,000 has been issued.

The officers of the company are Ernest Thalman, President; Edwin H. Mower, Vice-President; Charles Hayden, Treasurer; Jesse A. Downs, Secretary, and W. P. Leon, Superintendent. The directors of the company are as follows: Ernest Thalman, New York, N. Y.; Charles Hayden, Boston, Massachusetts; Edwin H. Mower, Boston, Massachusetts; F. B. Van Vorst, Hackensack, N. J.; Galen L. Stone, Boston, Mass.; W. E. Barrett, Boston, Mass., and Alfred Kimber, New York, N. Y.

The company owns the fee to 200 acres of land just west of Joplin and known heretofore as the Kohinoor tract. The land has been a fine producer for some years and continues to maintain its splendid record.

This office feels under obligations to this company for its courtesy and trouble in furnishing the data for the following detailed and very comprehensive statement of its business for the past two years. In this table will be found the number of pounds of lead and zinc produced, the price received for each ore, the value of the same and the royalities received from its lessees for each month during the years 1900 and 1901:

CONTINENTAL ZINC AND LEAD MINING AND SMELTING COMPANY.

	Zinc.				Lead.				Average prices.				Royalties.	
	Product, lbs.		Receipts.		Product, lbs.		Receipts.		1900.		1901.		1900.	1901
	1900.	1901.	1900.	1901.	1900.	1901.	1900.	1901.	Zinc.	Lead.	Zinc.	Lead.	Amount.	Amount.
January............	857,110	743,136	$13,150 92	$9,650 87	1,370	19,350	$38 68	$433 81	$30 68	$56 68	$26 00	$44 83	$1,980 36	$1,534 43
February............	424,260	380,130	6,474 73	4,384 96	6,690	2,010	182 60	44 72	30 52	54 58	26 56	44 70	1,007 81	666 73
March..............	1,213,850	1,385,120	17,879 80	18,009 12	....	19,970	....	457 10	29 46	....	26 00	45 77	2,683 44	2,795 01
April................	1,049,870	1,074,660	15,427 43	14,659 27	3,300	13,990	87 98	313 32	29 38	53 32	27 15	44 78	2,406 84	2,262 68
May................	1,098,830	1,008,010	16,376 21	13,705 70	13,630	28 170	340 41	646 62	29 80	50 00	27 20	46 12	2,524 56	2,185 20
June................	1,691,240	1,323,690	23,086 26	17,472 42	12,720	86,200	282 36	2,012 88	27 30	44 39	26 35	46 70	3,429 34	3,044 49
Six months.......	6,335,160	5,866,770	$92,395 35	$77,882 34	37,710	169,690	$932 03	$3,908 45	....	....	....	....	$14,032 35	$12,488 54
July.................	888,660	952,470	$11,554 22	$12,791 09	3,180	43,180	$69 42	$1,008 19	$26 00	$43 66	$26 43	$53 95	$1,747 03	$2,135 30
August.............	1,093,290	1,382,170	13,747 89	17,983 97	18,130	52,790	404 14	1,193 92	25 16	43 47	25 97	46 00	2,143 09	2,957 26
September......	1,112,240	1,384,060	13,606 12	17,537 16	2,720	9,380	58 67	218 06	24 46	38 00	25 33	46 50	2,052 75	2,088 81
October............	259,360	1,214,050	3,428 16	16,623 33	....	9,740	....	222 91	26 43	....	27 33	45 76	514 27	2,538 10
November.........	792,110	1,742 330	10,878 82	24,156 60	57,370	14,720	1,305 15	338 39	27 48	45 53	27 73	46 26	1,892 91	3,691 19
December	1,393,120	1,013,000	19,226 07	15,532 49	44,990	18,810	1,023 61	413 63	27 70	45 58	30 66	44 00	3,088 73	2,412 60
Six months.......	5,537,980	7,688,080	$72,441 28	$104,624 64	126,390	147,640	$2,860 99	$3,395 10	....	....	....	....	$11,438 78	$16,423 26
	11,873,140	23,552,856	$164,836 63	$182,506 98	164,100	317,320	$3,793 02	$7,303 55	$27 76	$46 24	$26 93	$47 00	$25,471 13	$28,911 80

This company does a leasing business principally and has the reputation of charging the most reasonable royalties of any company in the district. The statement following gives the name of each individual or company having a lease on the property, together with the lots and numbers of the same leased to the respective operators on its land:

No.		Lots.	Expires.	Extended to.
1	Glendale	7, 8, 9, 10, 11, 12, 222, 223, 224	Dec. 31, 1904	
2	Clover leaf	25, 26, 27	" "	
4	Captain	38, 39, S ½ 40, S ½ 51, 52, 53	" "	Dec. 31, 1909
	"	N ½ 40, N ½ 51, 41, 42, 49, 50	Feb. 9, "	" "
5	Sheldon	54, N ½ 55, 56, 57	Dec. 31, "	" "
	"	71, 72	" "	" "
6	Jack Harvard	58, 59	" "	" "
	" "	60, 61, 66, 67	" 1902	" "
7	H. A. Foster	64	" "	
	" "	65	" "	
	" "	80, 81	" 1904	
9	McGuire	70	" 1902	
14	Van Dalia	103, 104	" "	
22	Kohinoor	134, 135, 140, 141	" 1904	Dec. 31, 1909
	"	161, 162	" 1902	" "
	"	163, 164, 167, 168	" 1904	" "
	"	169, 170	" 1902	" "
	"	189, 190	" "	" "
	"	111, 112	" "	" "
	"	136, 137, 138, 139	" 1904	" "
26	Bristol-Joplin	149, 150, 153, 154	" "	
27	Live Mule	157, 174	" 1902	
31	Henn'y-Lynch	175, 176	" "	
35	Imperial	W ½ 90, 101	" "	
	"	99, 100	" 1904	
	"	119, 120	" 1902	
	"	127, 128	" 1904	
	"	147, 148, 155, 156	" "	
36	J. W. Ground	131, S ½ 143, 144	" 1902	
	" "	132, 133	" "	
	" "	142, N ½ 143	" "	
37	Marion	78, 79, 84, 85	" 1904	
38	Trouble	145, 146, 159, 172	" 1903	
39	Frances Rae	158, 173	" "	
41	Greyhound	68, 69, 75, 76, 77, 78	" 1904	
42	Luke, Ash	28, 29, 44, 45	May 19, 1902	
44	H. P. & P.	73, 74, 89, 102	Feb. 1, "	
45	Ground Finke	129, 130	Dec. 31, "	
46	J. E. Tedford	113, 114, 115, 116	Nov. 15, "	

Corrected to December 31, 1901.

There were 14 shafts operated during the year, having an average depth of 175 feet, with equipment as follows:

Nine concentrating mills, five hand jig plants, eighteen boilers, six pumps, eighteen steam hoisters, three horse hoisters, twelve crushers, eighteen steam jigs and fifteen hand jigs.

CROWN CREST ZINC & LEAD MINING COMPANY.

This company now owns and operates the property at one time known as the Crown Point Mining Co., comprising 107 acres located in the northwest of the northwest quarter of section 11 and the northeast of the northeast quarter and east half of the northwest quarter of the northeast quarter of section 10, all in township 27, range 32.

The company does a leasing business and the following concerns operated on the land during the year: G. R. Mosely & Co., Queen Bee

Mining Co., Princess Mining Co., Little Joe Mining Co., Granny Wiles, Moore & Co., lot 13, Prospect Mining Co., L. C. Caplinger and Blue Ribbon Mining Co.

There was mined on this land during the year 160,000 pounds of zinc, 400,000 pounds of silicate, 1,038,700 pounds of lead and 247,840 pounds of drybone. The new concentrating plants were built during the year and with the other equipment on hand the facilities are ample for a large business. Ten shafts were operated, their depth ranging all the way from 60 to 145 feet.

DAVEY & SON.

This firm owns a lease of 80 acres of land in the southeast quarter of the northwest quarter and the northeast of the southwest quarter of section 17, township 28, range 32, within the city limits of Carterville. This tract was one among the very first developed in this district and its output shows a value of $1,150,000. The land is still very productive and with good prices a larger showing doubtless would have been made. The output for the year shows 3,551,000 pounds of zinc ore and 1,028,170 pounds of lead. Nine shafts of an average depth of 120 feet were operated during the year and among the operators upon the land who are mining or preparing to do so are the Harding Mining Co., Whitley & Moore, Spencer & Co., Kaw Mining Co., Hammon & Co., Moss & Co., Flood & Co., Bell & Co., P. N. Davey, Bobtail Mining Co., Zenith Mining Co., Little Jennie Mining Co. and the Indianapolis Mining Co. There are four complete concentrating plants, four hand jig plants, ten boilers, six pumps, seven steam hoisters, four horse hoisters, six crushers, twelve steam jigs and seven hand jigs on the property.

DINKELBIHLER LEASE.

Mr. John Dinkelbihler is the owner of the 60-acre lease, formerly controlled by Haffner & Carl; it is located in section 13, township 27, range 33, and about three-quarters of a mile east of the city limits of Joplin.

Two shafts were operated during the year, 60 and 87 feet deep respectively, the output being 1,065,200 pounds of zinc ore and 30,400 pounds of lead ore. During the year seven new shafts have been sunk on this lease; two more applicants for lease privileges and the sinking of additional shafts; also the right granted to erect a complete mill. The following parties are now operating upon the land: Galena Mines, D. A. Hoover & Co., Burdell Mining Co. (now Carnagie Co.), H. & C. Mining Co., Crown Prince Mining Co. (Frederick H. Rogers, Manager), *Three Links* Co. (R. D. Sims & Co.), Happy Dutch (Louis Gast, *proprieter*).

DELLA S. MINING COMPANY.

This is a lease of 80 acres owned and operated by Ground & Patten, located on the south border of Webb City, in section 19, township 28, range 32. One shaft having a depth of 178 feet was operated during the year, with an output of 400,000 pounds of zinc ore.

ECLIPSE MINING COMPANY.

This company owns a lease of 180 acres near Neck City, in section 9, township 29, range 32. This property has for its general manager Mr. C. A. Blair, with postoffice address at Carthage, Mo.

This tract of land has been opened up during the year and it is claimed that in a number of drill holes sunk the ore was demonstrated in good bodies and since proven in eight shafts that have been sunk. The construction of a 150-ton mill was in process of erection and others contemplated for the year 1902. The company promises unusually liberal inducements to those seeking an opportunity to lease with a view to mining. Operations commenced as late as December 20th, 1901, and yet two turn-ins were made before the year closed, which showed 104,000 pounds of zinc ore and 41,405 pounds of lead ore. The operators on the property at this writing are F. M. Sponable, Wagner & Co., Buzzard Mining Co., Crow Mining Co., Lone Star Mining Co., Montezuma Mining Co., Lee & Co., Arbuthnat & Co., M. Zogg & Co., Sponable Mining Co. The plant at present consists of one mill complete, one hand jig plant, ten boilers, six pumps, eight steam hoisters, two horse hoisters, one crusher, two steam jigs and four hand jigs.

EXCEL MINING & PROSPECTING COMPANY.

This company has a lease on eight lots of the Murphy & Conner land at Joplin. One shaft having a depth of 100 feet was operated during the year, the production being 560,000 pounds of zinc ore and 48,690 pounds of lead ore. On this lease there are one concentrating plant, one boiler, one pump, one steam hoister, one horse hoister, one crusher and two steam jigs.

EL DORADO MINING COMPANY.

This company owns a lease of 28 acres within the limits of Carterville, in section 17, township 28, range 32. Messrs. J. A. Bowman of Webb City and George Davidson of Carthage composing the company. There are six shafts of an average depth of 155 feet which were operated during the year, turning out 2,530,112 pounds of zinc ore and 759,350 pounds of lead ore which sold for $43,637.99.

The ore is found in the sheet formation in hard ground. The equipment is made up of three complete concentrating plants, four hand jig plants, six boilers, three steam pumps, one air compressor, four steam hoisters, two horse hoisters, three crushers, six steam jigs and six hand jigs. The lease holders or parties operating on land are W. G. Davidson, J. A. Bowman, J. M. Burgner, C. W. Summers, H. H. Moore and F. M. Brock.

The Mary S. Lead & Zing Mining Co., F. J. Ball, President, and Superintendent, has a lease on four lots, operating one shaft having a depth of 155.' The equipment consists of one complete concentrating plant with all needed machinery and appliances for the proper handling of its product. This mine turned out 946,000 pounds of zinc ore and 73,580 pounds of lead ore during the year which sold for $11,698.92.

ELEVENTH HOUR MINING COMPANY.

This company has not only attracted much attention and comment because of its name, but because of its wonderful productiveness as well. The first prospecting upon this land goes away back to the early 80's and for years many unsuccessful efforts had been made by numerous parties to uncover the ore body. The present holder of the lease on this property, Mr. J. W. Aylor, experienced failure after failure here for three or four years, and when about ready to despair of ever finding anything, struck a small pocket of lead; this had the effect of stimulating him further and lead on to renewed effort, though at times doubtful whether or not the little find justified the necessary expenditure of time and money for further development. Mr. Aylor was energetic and nervy (ever required qualities in lead and zinc prospecting) pushed his work uninterruptedly for the following six months meeting success at the eleventh hour as he expressed it, which may have meant to him the eleventh hour of his ability and patience. At any rate he named his mine the Eleventh Hour, metaphorically, as indicating how near he came to loosing it, and as we now see it the magnificent fortune it has brought him, as Mr. Aylor after many years of very successful operation of the property was only a few years ago offered, we understand, $250,000 for his lease. This lease embraces 120 acres owned in fee by Mrs. E. J. Chinn of Webb City, who, prior to her marriage, was a Miss Webb. This tract of land is at Prosperity, a village situated about two miles southeast of Webb City and due south of Carterville. Since operations commenced on this ground at least fifty shafts have been sunk, a number of them encountering the ore body and worked successfully. It is claimed that, if a more liberal royalty had been tendered operators, a much greater output would have resulted. The shafts sunk in which the ore body was developed range in depth from 150 to 247 feet. The 247 foot shaft is one of the deepest shafts in the district and at this great depth a rich body of ore was discovered, but not worked owing to the amount of water encountered. Some day it is to be hoped a concentrated effort will succeed in the drainage of the lower levels and the large bodies of ore claimed to exist there be systematically mined. The product from this property during the year shows 4,280,572 pounds of zinc ore and 933,850 pounds of lead ore. Seven shafts averaging 175 feet in depth are in operation, six concentrating plants, together with numerous boilers, hoisters and jigs.

EMPIRE ZINC COMPANY.

This company owns the fee to 200 acres of land, a part of which is embraced in the extreme southwest corner of the city limits of Joplin. This company does no mining on its own account, but leases the land to operators on a royalty. The work during the year appears to have been in gouging the ground or taking ore from the old workings in a catch as catch can manner, and yet there was mined in this way 1,110,000 pounds of zinc ore and 288,000 pounds of lead.

ESTRADA LEASE.

Rafel Estrada owns the lease on 80 acres of land in the east half of the southeast quarter of section 33, township 28, range 33, near the northwest corner of the city limits of Joplin. Two mines were operated by sub-lessees during the year. The Amsden Mining Co. with a shaft 142 feet deep and the Tebo Mining Co., with a shaft 130 feet in depth. The product of the Amsden was 2,454,000 pounds of zinc ore and of the Tebo Mining Co., 408,000 pounds of zinc ore. The Amsden was engaged in prospecting three months out of the year, while the Tebo was engaged in development work the greater part of the time. Altogether about ten shafts have been started on the lease during the year, but otherwise very little work has been done in the way of improvement. There are two concentrating plants, and other facilities on the lease capable of handling the product.

EAST HOLLOW MINING COMPANY.

This is a partnership arrangement, with Mr. E. V. Wysbrod as General Manager. This company owns the fee to 140 acres in Galena township, section 31, township 28, range 33. Capital invested in land and plant, $20,000. There are a number of lessees at work on the land and apparently in the prospecting stage, among which are the Huckelberry, Sunflower, *Somerset*, Gretchen, Lena, Beardstown and Eureka

Mining companies. The output from the lease was 1,000,000 pounds of zinc ore. The equipment embraces one concentrating plant, five boilers, five pumps, five steam hoisters, three horse hoisers, one crusher, two steam jigs and five hand jigs.

FREEMAN LAND AND MINING COMPANY.

This company owns a lease on 80 acres of land located at Zincite, in section 25, township 28, range 34. It has one shaft 150 feet deep, from which it has produced 2,390,540 pounds of zinc ore, which sold for $34,662.93. This is a comparatively new mining proposition, but its promise for a very productive property is most flattering. It has a complete concentrating plant, boilers, pumps, hoisters and steam jigs and crushers with which to expeditiously treat and handle the ores produced.

FORRISTALL & O'DONALD.

These parties have a lease on a 40-acre tract in the southwest quarter of the northeast quarter of section 29, township 28, range 32, on which there are two shafts that produced ore during the year. There are now four shafts on the property, having depths of 175,225,227 and 245 feet respectively. Considerable work has been done in the sinking of shafts. The equipment consists of two concentrating plants, three boilers, two pumps, four steam hoisters, two crushers and four steam jigs. The output shows 1,006,000 pounds of zinc ore and 138,280 pounds of lead one.

GILCHRIST PORTER REALTY COMPANY.

This company controls 20 acres of land in the southeast of the southwest quarter of section 2, township 27, range 33, on which five mines were operated during the year, shafts ranging in depth from 70 to 130 feet. The improvements embraced, one concentrating plant, three hand-jig plants, three boilers, two pumps, three steam and two horse hoisters, one crusher, two steam and five hand jigs. The following parties are operating on this tract: W. Armington operates three shafts, mines located on 5th street, Joplin; Zolo Mining Co., H. Watkins, Manager, operates two shafts; mines located on 7th street, Joplin. The output from this property during the year shows 1,132,000 pounds of zinc ore and 383,020 pounds of lead ore, which sold for $24,000. The promise of increased production on this land is excellent.

THE GRANBY MINING AND SMELTING COMPANY.

The Granby Mining and Smelting Co. is the largest company in the Southwest Missouri zinc and lead district. Its principal operations are at Granby, Newton county, Missouri, which can boast of being the parent camp of the richest zinc mining district of the world.

The first extensive mining there was in 1850, when the hand windless and horse hoisters were the only methods in use for lifting out the dirt and water and lowering and raising the miners to and from the mine.

In 1857, mining was actively under way at Granby, and in 1865 the Granby Mining and Smelting Company was incorporated and extensive operations were immediately begun, and have since continued, and from that date to the present the company has continued to grow, adding from time to time to its holdings of mineral lands, until it has become one of the largest zinc and lead mining companies in the United States, with large tracts of valuable mineral lands, aggregating some 15,000 acres, located at Granby, in Newton county, and at Joplin and Oronogo, in Jasper county, Missouri, that produce over $1,000,000 worth of ore per year.

Since 1865, there has been produced and marketed from the lands of this company over $30,000,000 worth of zinc and lead ores.

The Granby company also has large holdings of mineral lands in Morgan county, Missouri, and in Newton county, Arkansas.

At Granby the company operates a lead smelter, with an annual output of 5,000 tons of pig lead.

In October, 1901, the company arranged to sink a deep drill hole at Granby, 3,000 feet deep, in the hope of discovering a deep body of lead or zinc, or an artesian well, or gas or oil. In the event that cheap fuel is discovered, as a result of this deep drill hole, it is the intention of the company to erect a large zinc smelter at Granby.

In former years the Granby company operated a zinc smelter at Pittsburg, Kansas, and were large producers of spelter.

The company is also sinking a deep drill hole on its Oronogo land.

During the past year the Missouri Pacific Railway Company has arranged to extend its line from Webb City to Granby, and expects to have trains running over the new tracks by March 1st, 1902. This will afford Granby the best possible freight and passenger service from the two great railway systems of the Southwest, viz., the Missouri Pacific and St. Louis & San Francisco R. R. companies.

In 1896 Mr. Elias S. Gatch became General Manager of the Granby company, and the broad and liberal policy then instituted has resulted in a large development of the property, and promises well for its future growth and expansion. Further details relating to the property of this company in Newton county will follow under head of said county.

The Granby Mining and Smelting Company, in the Joplin field, owns 988 acres of mining land, on which there are (10) ten concentrating plants, fifteen hand-jig plants, twenty-five mines actually producing ore, having an average depth of 110 feet, twenty-five steam boilers, twenty steam pumps, one air compressor, fifteen steam drills, twenty-five steam hoisters, six horse hoisters, thirteen crushers, twenty-two steam jigs, twenty-four hand jigs. An average of 207 miners and 25 other men have been employed in and about the mines and fifteen men prospecting the land covering the Joplin field during the year. The zinc output of the mines at Joplin for the year amounted to 16,164,000 pounds; the lead product was 4,265,800 pounds with a total of $283,871.41 received for the product.

The following are the principal operators on this land: Rafel Estrada, Davis, Ball & Gunning, Royal Blue, Connecticut Zinc Co., Anderson Mining Co., Tennessee Mining Co., Cliff Lead & Zinc Co., Grace Mining Co., Corn Palace Mining Co., W. M. Cunningham and Buckeye Mining Co. Estrada—R. Estrada has a lease on eleven acres of the Granby land, northwest of Joplin, on which he has one shaft 150 feet in depth, the ground is hard, carrying lead and zinc in small quantitq. During the year the work has been confined mostly to prospecting. There is a good mill connected with this lease.

Royal Blue Mine is on the Granby land 1 1-2 miles northwest of Joplin, and embraces in it a lease of 15 acres owned by Edward H. Shattuc. There are two shafts on the lease 140 and 150 feet in depth, respectively; one 100-ton mill complete in every respect, two steam boiler pumps, two steam hoisters, crusher and two steam jigs. The mines produced last year 1,164,000 pounds of zinc and 288,890 pounds of lead. The mill burned during the year, but was speedily rebuilt again.

Buckeye Mining Co., northwest of Joplin on the Granby land, is operated by S. T. Clark, who owns a lease of 9 1-2 acres. One shaft 85 feet deep has been operated a short time only. Two boilers, steam hoister, crusher and two steam jigs comprise the present equipment.

The Tennessee Mining Co. owns a lease of 14 acres near Chitwood, on the Granby land. Two shafts, one 145 and the other 170 feet in depth, have been operated during the year and produced ore valued at $12,000. This property was opened up during the year and mill erected, boilers, pumps, hoisters and steam jigs installed.

Connecticut Zinc Co. owns a lease of the Granby land, located near Joplin, in what is known as Leadville Hollow, C. B. Foster, Superintendent, with headquarters at Joplin. One shaft at a depth of 140 feet showed a good face of ore in hard ground and has been worked during the year quite successfully, producing 1,295,000 pounds of zinc and

369,970 pounds of lead. Concentrating plant, boilers, pumps hoisters and steam jigs embrace the equipment. Mr. H. S. Bullard is Secretary, with postoffice address, Hartford, Conn.

Cliff Lead & Zinc Mining Co. This company owns a lease of 14 acres on the Granby land near Joplin, on which two shafts 80 and 156 feet have been sunk. The equipment consists of concentrating plant, two boilers, three pumps two steam hoisters, crusher and two steam jigs. The output for the year was 677,000 pounds of zinc and 55,540 pounds of lead. A royalty is paid the Granby Co. of 20 per cent on lead and 15 per cent on zinc ore. The improvements here during the year was the sinking of a second shaft 156 feet deep and the erection of a new and very complete mill.

W. M. Cunningham owns a lease of 11 1-2 acres of the Granby land north of Joplin, of which he become possessed July 9th, 1901. There are two shafts on the lease, one 145 and the other 170 feet deep. Since the property has changed hands additions have been made to equipment, drifts extended and other prospect work performed.

Shellaberger & Brenner have a lease in Leadville Hollow near Joplin on the Granby land of 17 lots, on which there are two shafts and one producing mine. Shafts 147 and 155, respectively. The entire plant has been placed during the year and consists of two boilers, five pumps, one air compressor, two steam hoisters, crusher and two steam jigs. The production has been very good for the time the mine has been operated by this company, showing 2,559,000 pounds of zinc and 276,000 pounds of lead ore, which sold for $51,000.

The Granby Mining and Smelting Co. property at Oronogo embraces 1,280 acres of land on which there are 24 producing mines. This has been for years a very large producing camp. During the last six and one-half years the output of this company from this camp alone has been 153,706,000 pounds of zinc and 7,761,340 pounds of lead. The value of the output from this property during the past year amounts to $344,667.23 The equipment on this ground consists of fifteen concentrating plants, thirty-three steam boilers, twenty-one steam pumps, three air compressors, twenty-two steam hoisters, fifteen crushers, fifteen complete sets of steam jigs. The mines give employment to 250 miners and 75 other employes. The output of zinc for the year was 25,862,000 pounds and 902,640 pounds of lead.

The following companies have leases from the Granby at this camp: Latosca Mining Co., Bunker Hill Mining Co. and subs, Boston Little Circle Zinc Co., Hill Top Mining Co., Texas Star Mining Co. and subs, and Jasper Lead & Zinc Co.

The Latosca Mining Co. has a lease of six lots on the Granby land at Oronogo: it has a capital stock of $40,000, and operates one shaft, the depth of which is 167 feet. The plant is a very complete one, and embraces all the necessary machinery for the rapid and economical handling of the ore. The output for the year was 4,284,000 pounds of zinc. This has been a good producing piece of ground; the character of the ground is of such character as to enable it to be worked without timbers, while the face has all along shown up a good body of profitable working ore. The royalty paid by this company is 15 per cent. Mr. Isaac Kahn is the Superintendent in charge of the mine.

Big Circle Mining Co. The mines of this company are located at Oronogo, on the Granby land; Mr. H. Myers, superintendent. One mine has been operated during the year, the shaft reaching the depth of 180 feet. The ore from this mine has steadily maintained a very high price because of its quality; the ore is found in hard ground and no timbering needed. The equipment consists of a complete concentrating plant, two steam boilers, two steam pumps, one air compressor, three steam hoisters, complete set of steam jigs, crushers, etc. There have been 14 miners and 7 other men empolyed on an average throughout the year, with an output of 2,637,000 pounds of zinc, on which the Granby company receives a royalty of 20 per cent.

Boston Little Circle Zinc Co. has 12 shafts on the land leased by it from the Granby Mining & Smelting Co. near Oronogo. Some very rich strikes of ore have been developed and mined on this property. Our last visit to this mine found it shut down, this visit following immediately after the great cave-in of the Aurora mine adjoining, and as soapstone bars were known to exist between the two mines, the miners and management both feared the possibility of a slide which would prove disastrous to this mine also. We went through the Big Circle underground work and as far into the Little Circle as safety would permit, and the light of recent events feel that the Granby company did exactly right in forfeiting the lease to that company.

Hill Top Mining Co. has a lease on 20 acres on the Granby land at Oronogo. The postoffice address of this company is 1201-135 Adams street, Chicago, Ill., and also Oronogo, Mo.; H. H. Hamlin, Manager. This is an incorporated company and places the amount of capital invested in plants at the several mines at $140,000. The work of sinking shafts by this company commenced October 20, 1900, and during the past year three shafts running from 130 to 165 feet in depth have been sunk and mines opened up which produced 3,911,810 pounds of zinc and 365,180 pounds of lead. Development was being carried on quite extensively by sub-lessees of this company when last visited.

Texas Star Mining Co. has acquired a lease on about 60 acres of the Granby land just north of Oronogo. There were four producing shafts on this property during the year. There are a number of sublessees at work, known as the Security Lead & Zinc Co., Two Sleaves, Nanney & Co., Williams & Co., Moore & Jones and F. M. Black & Co. that will open nine mines, each one of which, we hope, will prove fine producers. The shafts will reach the ore from 160 to 180 feet.

The Oronogo Zinc Concentrates Co. has a mill for cleaning sludge and tailings on the Granby land, and during the year produced in this manner 1,376,000 pounds of zinc and 2,160 pounds of lead valued at $15,298.95.

The Granby Mining & Smelting Co. is to be commended for its enterprise, prudence and good judgment shown in the appointment of its own mine inspector. While this may not appear any too creditable to the great State of Missouri, yet this company from its long experence realizes the absolute necessity of close mine inspection and rather submit to the scattered inspection which the State furnishes, it employs an inspector of its own as it knows it is a physical impossibility for one man to inspect thoroughly and often enough the great number of lead and zinc mines in this State.

R. HAGADORN.

Mr. Hagadorn owns a first lease on 30 acres of land in West Hollow, near Zincite, on which there are four shafts down to a depth ranging from 80 to 100 feet in depth. There are one concentrating plant and four jig plants, four steam boilers, two pumps, one steam hoister, three horse hoisters, one crusher, one set of steam jigs and eight hand jigs on the lease.

The operators on the lease are D. McConey, C. L. Earl, C. C. Chadwick and R. Hagadorn.

HOLDEN BROS. MINING COMPANY.

This company holds a lease on 40 acres of land, being the northwest of the southeast quarter of section 13, township 28, range 34, just north of Belleville. Five shafts, ranging from 100 to 136 feet were operated during the year, producing 683,590 pounds of zinc ore and 870 pounds of lead ore. The lessees are L. Gerky and L. E. Holden, George McCumber, J. Hildreth & Co., State Bank Mining Co., C. C. Arnold and R. Dunham. One concentrating plant, five hand-jig plants, four boilers, four steam pumps, one steam and three belt hoisters, two horse hoisters, one crusher, two steam jigs and fifteen hand jigs embrace the equipment.

HOMESTEAD ZINC & LEAD MINING COMPANY.

This company owns the fee to 80 acres of land in the northwest of the northeast quarter of section 17, township 28, range 32, near Carterville, with Mr. George H. Warne as Superintendent. There are three shafts upon the land of an average depth of 180 feet which were operated during the year. The product from this property shows that there was mined 3,904,000 pounds of zinc ore and 393,000 pounds of lead ore, which sold for $59,889. The equipment embraces two complete concentrating plants, boilers, pumps, steam hoisters, crushers, etc.

HUDSON MINING COMPANY.

The Hudson Mining Company controls 16 acres of land near Carthage, on which it commenced mining in October last. One shaft 210 feet deep was operated during a part of the year, the mine producing 1,742,000 pounds of zinc ore, which sold for $25,982.92. One concentrating plant, two boilers, one pump, one air compressor, one steam hoister, one crusher and three steam jigs constitute the equipment. The mine furnishes every evidence of becoming an excellent producer.

IHLSENG MINING COMPANY.

The 20-acre lease controlled by this company is located in the northwest quarter of section 2, township 27, range 34, near Cave Springs. There are seven shafts on the land having an average depth of 110 feet, with the following parties operating same: Frank Nickolson, Ihlseng & Norton, King & Co., J. W. Hardwick and the Commonwealth Zinc Co., with thirty men employed. The ore is found in hard ground where no timbering is necessary where the drifts are properly cut; the ore shows a twenty-foot face. The output from this land during the year was 2,486,800 pounds of zinc ore and 230,150 pounds of lead ore, which sold for $34,567.35. With better prices this ground can be made to increase its production, the conditions warranting the statement. There are two complete concentrating plants on the lease and a full complement of boilers and pumps of large capacity and other facilities for handling and cleaning the product.

I KNOW MINE.

This mine is located on the John H. Taylor 100-acre tract directly west of Joplin. The lease of five lots was originally owned by W. C. Wetherell and others and became quite famous as a producer. The ore body was penetrated at 105 feet and followed to the 160-foot level, drifting in soft ground was prosecuted very successfully until the cave-in occurred, which completely stopped work for a long time. The company made its first turn in of lead ore December 13th, 1894, and its first turn in of zinc four days later. Some idea may be gathered of the productiveness of this mine by the record made from May 17, 1895, to June 1st, 1897. The 546 days between these dates when the work of hoising dirt was actually employed, 9,786,830 pounds of zinc ore, and 554,650 pounds of lead ore was produced and showing 9.74 per cent of the gross total of all dirt handled. The revenues derived from the above output less 20 per cent royalties amounted to $92,832.65; the operating expenses for the period was $36,133.41, leaving net to the lessees $56,699.24.

The original capital stock of the lessees was $5,400. The plant is an excellent one and handled 125 tons per shift. Doubtless those who are acquainted with the small and unsatisfactory operations carried on at this mine of late years will wonder why so much has been said concerning this virtually abandoned mine. We in explanation give as a reason based upon the experience in Southwest Missouri, where so many old mines have been reopened, revived and made productive, that with late evidences of successfully reopening the I Know mine we hope to have the pleasure of recording a large output from this property for the year 1902. How many of the old mines are there that were considered worked out that have since, under wise management, better facilities and good prices been reopened and made productive. The "I Know" was sold in February and parties have released it and are engaged at present in further prospecting it. Ore to the value of $3,805 was mined on the ground during the year.

INDEPENDENCE MINING COMPANY.

This is a lease of 106 acres two miles northeast of Joplin on the Miller land. There are two shafts on the lease having depths respectively of 164 and 172 feet. One shaft only was operated during the year, which produced 1,208,000 pounds of zinc ore. One complete concentrating plant, two boilers, two pumps, two steam hoisters, one crusher and two steam jigs comprising the equipment.

INVESTORS MINING COMPANY.

This is a lease of 40 acres located just west of Webb City, Mo. One shaft having a depth of 200 feet was worked during the year and the production amounted to 928,000 pounds of zinc ore and 110,050 pounds of lead ore. There is one concentrating mill fully equipped, two boilers, one pump, two steam hoisters, one horse hoisfer, one double 12-inch crusher and two setam jigs on the lease.

THE ISHPEMING MINING COMPANY.

This company owns and has under lease 200. acres of land near Carl Junction; the lease part of the land is owned by A. Knight.

Four shafts appear to have been worked spasmodically during the year and known as "A" shaft, "B" shaft, "C" shaft and Frisco. "A" shaft is located on a 10-acre strip of the Knight land, on which there is a shaft 146 feet deep worked only part of the time, the output being 1,904,375 pounds of zinc ore, which sold for $22,537.47 There were thirty men employed during the first six months of the year.

"B" shaft is another 10-acre strip on the Knight land about one mile southwest of Carl Junction. The shaft has reached a depth of 46 feet on this tract, having produced 16,175 pounds of lead, when operations ceased for the time being.

"C" shaft is located on a 10-acre strip of the Knight land and about one mile southwest of Carl Junction. One shaft 115 feet has been opened up and developed within the last six months of the year, making a very good showing for the time operated, there having been mined 2,172,635 pounds of zinc ore and 308,252 pounds of lead ore, which sold for $36,390.87. Hoisting plant, 1,300 feet of tramway, an 8-inch walking beam pump installed.

The Frisco is on an 80-acre tract belonging to the company and located two and one-half miles south and east of Carl Junction. One shaft 147 feet deep was operated part of the year, producing 598,630 pounds of zinc ore. The shaft was not in operation at the close of the year. There are three concentrating plants, one hand jig plant, six boilers, two steam and four walking beam pumps, one air compressor, three steam and two gasoline hoisters, two crushers, one set roughers 5 cell, one set 4 cell, one set cleaners 5 cell and one set cleaners 6 cell steam jigs.

JEANETTE MINING COMPANY.

J. H. Dangerfield of this company owns the lease on 37 acres of land in the northeast of the northeast quarter of section 6, township 27, range 33. The equipment consists of one hand jig plant, one boiler, one pump, one steam hoister, three horse hoister and five hand jigs. One shaft was operated during the year, the ore being found at the 140-foot level. The *output was as follows*: 522,000 pounds of zinc ore and 75,750 pounds of *lead ore.*

JOHN JACKSON MINING COMPANY.

This company owns the lease on 51 acres of land in section 32, township 28, range 33; it is incorporated under the laws of New Jersey and capitalized at $105,000. Mr. Chas. E. Hart of Joplin is its general manager. Frank Church and Dan Collins, both of Joplin, originally acquired the lease on this property and sunk one shaft on it, after operating about a year, they sold their lease to the John Jackson Mining Co., this was about January, 1898. Since that time the product from this one shaft has reached the great sum of 21,847,210 pounds of zinc ore. The manager of this mine points with pride to a record of 417,000 pounds of ore in one weeks run and the sale of the same for something over $13,000, and claims that this has not been met by any shaft in the district. Evidently the sale for the week mentioned must have carried with it lead ore or more zinc ore than was produced in the week's run referred to, as the price per ton would be beyond all past experience. This mine, however, since the above information was furnished and during the third week of February, 1902, has a record of an average for seven consecutive days of 84,120 pounds per day, which would for six days give 504,720 pounds or an increase over the former record of 87,720 pounds. The manager of the John Jackson also claims the greatest single shift record of 62,840 pounds. During the present management, it has not been charged up with a single accident worthy of note; this is largely due to the nature of the ground, as it is extraordinarily safe, and then again to the commendable care taken to avoid accidents, a competent engineer being employed to examine carefully each day every piece of machinery connected with the plant to the smallest detail; then again great care is taken after shots are fired in examining and clearing the roof. The drifts in this mine are on an average 70 feet in heighth and 60 feet wide. The mill and all equipment is first-class in every particular, and the same may be said of its management, except in answer to questions concerning output when once he has furnished it. This office being familiar with the producing qualities of the John Jackson and noticing that its output for 1901 was comparatively small and in view of a seven days' production amounting to 588,840 pounds, we had the temerity to ask General Manager Hart if it was possible that an error could have been made, backing up our venture with some figures that we secured from the newspapers. His reply was simply savage, and we shall hereafter take his figures without question. For the year 1901 the output is given as 3,479,500 pounds at an average price of $25.00 per ton. It is likely that the management of this mine like others in the district curtailed work while prices were low.

The Jack Johnson Mining Co. has a lease from the John Jackson Mining Co. of six acres, on which there is a shaft 180 feet in depth, a concentrating plant, two steam boilers, one pump, one steam hoister, one crusher and two steam jigs. Its output for the year in zinc ore was 1,090,190 pounds, averaging $25.78 per ton. The formation in this mine is peculiar, and has the appearance after extracting the ore body of a great high circular room; the ore reached from floor to roof, a distance of 100 feet in height, the roof of which must have arched itself, as the width of the room (70 feet) is too great for a flat roof. This mine has been a great producer for the last year and a half, producing over 3,000,000 pounds of zinc and yet not worked continuously during that period, owing to the fact that the floor was so soft and the failure to timber the same, as it was thought it should be.

KATIE "C" MINING COMPANY.

This company has a lease of five acres on the Connor land at Carterville, and an investment of $8,000 in plant and equipment. The improvements consist of concentrating plant, steam boiler, hoisters, jigs, and crusher. Only one mine worked during the year, the shaft having a depth of 217 feet, the product from this mine was 1,748,000 pounds of zinc ore and 2,380 pounds of lead ore and sold for $24,172.28. This is a good mine with a fine prospect for large production during the current year. Mr. P. C. Nolan is secretary, and the postoffice address of the company, Joplin, Mo.

JOHNSON, WILLETT & COMPANY.

This company has a lease on two acres of the Baker land at Center Valley and a capital of $10,000 invested in equipment.

A complete concentrating plant has been erected and boilers and hoisters supplied. Two shafts are operated which will average 156 feet in depth. Operations on the property by Johnson, Willett & Co. did not commence until July, 1901, thus giving them about six months for development and other work. They produced 602,000 pounds of zinc ore and 14,900 pounds of lead ore, valued at $6,017.74.

LECKIE MINING COMPANY.

This company controls the lease on 40 acres of land in the northwest of the northeast quarter of section 7, township 27, range 32. This tract has had nothing done on it for the past two years; but Mr. W. M. Leckie informed us that his company was already preparing to again open up the property, and that the pumps would be started in a short time.

At the time three new shafts were being sunk and very good results expected from them.

LEWELLEN BROS.

This firm is successors to the West Hollow Mining Co., which owned the fee to 150 acres of land, in the southwest half of the southeast quarter of section 25 and the east half of the northwest quarter of section 36, township 28, range 34, near Zincite. Mr. G. McDole, agent for Lewellen Bros. of Gaylord, Kas., informs us that the land is in process of forfeiture by lessees for non-payment of royalties. The output of this property during the year was 396,500 pounds of zinc ore and 60,690 pounds of lead ore, which sold for $6,415.

LUCKY TOM MINING COMPANY.

This company owns a lease of six acres located between Prosperity and Duenweg. Mr. Frank Stafford, superintendent. One shaft, 160 feet in depth was worked during the year, producing 2,700,000 pounds of zinc ore and 300,000 pounds of lead ore, which sold for $33,825. Morgan & Co., Foster & Co. and Good & Co. are sub-lessees on the lease. The plant is a good one, answering fully all demands made upon it.

LINCOLN MINING COMPANY.

The postoffice address of this company is Box 385, Joplin, Mo. The company is incorporated under the laws of West Virginia, with a capital stock of $100,000, of which $50,000 is preferred stock.

It owns a lease on 70 acres of land, 40 of which are in the northwest of the northwest quarter of section 23, township 28, range 33, situated about seven miles northwest of Joplin. The royalty paid by the company is 10 per cent. Three shafts were operated, their depth ranging from 115 to 130 feet. The ore is high grade, free, and the mining is on what is known as open ground. The end of the year found two new shafts being sunk, of which one was nearly completed. The production for the year was 5,320,000 pounds of zinc ore and 200,000 pounds of lead ore, which sold for $71,116.97.

The improvements on the property embrace one concentrating plant complete, two boilers, two steam pumps, three steam hoisters, one crusher and four steam jigs.

LEONARD MERCANTILE AND REALTY COMPANY.

This company owns 120 acres in what is known as Chitwood Hollow, a locality long celebrated for its mineral production, but perhaps more so now than heretofore on account of the recent heavy production from that section. The Leonard does a leasing business exclusively and aside from the above named property, it owns other valuable property worth $100,000, there being some 1,231 acres altogether. On the Chitwood Hollow land belonging to the company the following operators have leases, and are either producing or preparing to do so:

Beacon Hill, one shaft, B. F. Rogers, superintendent.
Lackawana, one shaft, M. Mears, superintendent.
Bessie, one shaft, J. S. Given, superintendent.
William Tell, one shaft, J. S. Given, superintendent.
St. Louis, two shafts, Elias Tobias, superintendent.
Boston Cherokee, one shaft, Frank Nicholson, superintendent.
Cumberland, one shaft, W. O. Hoffman, superintendent.
Black Hawk, one shaft, R. S. Rogers, superintendent.
Brooklyn, one shaft, G. W. Playter, superintendent.
Pittsburg, three shafts, M. Beals, superintendent.
Jumbo Co., four shafts, Adam Scott, superintendent.
Lizard, one shaft, A. H. Hall, superintendent.
Jack Pot, one shaft, Geo. Wheaton, superintendent.
Butte, one shaft, Geo. Wheaton, superintendent.

Of the above there were twelve shafts which actually produced ore during the year, the output being 6,268,000 pounds of zinc ore and 1,272,000 pounds of lead ore, which sold for $97,615. The following leases upon the land are noted:

Bessie M. J. G. Given, Superintendent, has a lease of five lots on which one shaft 153 feet has been sunk, its output being 1,108,000 pounds of zinc ore and 69,220 pounds of lead ore. The improvements here during the year consists of an expenditure of $2,500 in the general betterment of the plant, driving a drift at the 153-foot level to connect with the William Tell shaft, thus furnishing a better air for both mines and increasing the opportunity for exit in case of an accident to the hoisting shaft or otherwise.

The Inspector suggests just here, that if this was practiced more generally it would prove most beneficial to both operator and miners and the added security is worth much more than the cost where the conditions are similar. The Bessie has a complete concentrating plant and such other facilities as meet all of its wants.

The William Tell Mining Company. J. G. Given, General Manager, had not reached the state of development to produce much as it took possession November 18th, 1901. Its lease covers 4 1-2 acres and at the close of the year found its shaft down 85 feet only; but since then we *find the shaft has* been sunk to the 135-foot level and connected with the *Bessie by a drift.*

The Lizard Mining Co. has a lease of nine lots on the Leonard land, and claims to have the best lead mine in Southwest Missouri. The shaft is only 60 feet deep, and yet its entire output amounting to $30,000, with the exception of a 100 tons of zinc, was derived from its lead product.

The Superior Mine, formerly the St. Louis. Mr. Elias Tobias, Superintendent, has a lease of six acres on the Leonard land and operations are expected to commence about April 15, 1902. The shaft is down 140 feet and a very promising face of ore exposed. The mill which is to have a capacity of one hundred tons is contracted to be completed April 15, 1902. Boilers, pumps, steam hoisters and jigs are in place. The Bay State Zinc Mining Company, the Jack Pot Mining Company, the Butte Mining Company and the Brooklyn are all as yet in the prospecting stage and should they prove as good producers as their neighbors, a great output may be expected from the Leonard land for 1902.

LEAD HILL MINING COMPANY.

This company controls 40 acres of land located at Duenweg, there being three companies operating on the land under a sublease: The Bulen & Co., Gooch & Co. and the Venango Mining Co. Three shafts were operated during the year with depths of 40, 60 and 100 feet. The production so far on this land has been largely lead ore, as may be seen by the output, which shows 18,000 pounds of zinc ore, 38,900 pounds of silicate, 183,560 pounds of lead ore and 48,880 pounds of drybone.

MONTGOMERY LEAD & ZINC MINING COMPANY.

The property of this company embraces 200 acres of land in sections 27, 28 and 33, township 28, range 33. The tailing mill on this property produces about three-fourths of the output; otherwise very little work was done, the water being pumped from but one shaft. Such changes are being made here that with an increased price for the ore a great revival of work on the land may be expected. The output for the year shows 938,00 pounds of zinc ore and 1,400 pounds of lead ore.

MT. ARARAT MINING COMPANY.

This embraces a 10-acre lease owned by T. W. Hill of Webb City, and is on the Connor land at Prosperity. This property is surrounded by some of the most productive mines in the Carterville district. Since our last report it has doubled its output and indications point to an increased product for 1902. There was an output for the year of 3,767,050 pounds of zinc ore and 255,940 pounds of lead ore, which sold for $51,028 as against $20,859 for the fiscal year ending June 30, 1900. There are four shafts on the lease, ranging in depth from 130 to 250 feet. Mention is made of the Oregon Mining Co., which has a lease on one lot, with one shaft down 140 feet, with a production of 362,140 pounds of zinc ore and 42,840 pounds of lead ore.

The Cube Root Mining Co. has a lease on two lots, with shafts 135 feet deep, producing 188,740 pounds of zinc ore and 11,920 pounds of lead ore. The improvements on the land embrace, two concentrating plants and two hand-jig plants, two boilers, one steam pump, three steam hoisters, two crushers, two steam jigs and six hand jigs.

McKINLEY MINING COMPANY.

This company is incorporated under the laws of New Jersey, with its main office at Trenton, N. J. It controls a lease of 60 acres of Connor land, located just south of Carterville, in section 28, township 28, range 32. This land was originally prospected by Wise & Connor by drilling, lead being demonstrated at 90 feet and zinc at varying depth from 130 to 200 feet. This has been a fine producing property for some years, and averaged during the past year 100 tons of ore per week, with a total output of 9,932,000 pounds of zinc ore and 632,950 pounds of lead ore, which sold for $136,284.

The sub-lessees on this property are as follows: Aida No. 2 Mining Co., Maud B. Mining Co., Dell "C" Mining Co., A. F. Thomas Lead Shaft, Ashcraft & Co., Goodenough Mining Co. and McKinley Sludge Mill.

Aida No. 2 Mining Co. has a lease on seven acres, operates one shaft 209 feet in depth and produced 3,171,000 pounds of zinc ore and and 42,730 pounds of lead ore, which sold for $43,303.36.

Maud "B" Mining Co. has a lease on four lots, operates one shaft 210 feet in depth, producing 4,126,000 pounds of zinc ore and 47,230 pounds of lead ore, which sold for $57,008.53.

Goodenough Mining Co. has a lease on two lots, operates one shaft 180 feet in depth. This company had the misfortune of having its mill burned down in May, 1901, which not only greatly interfered with its operations, but cut down its output, which shows 399,500 pounds of zinc ore and 34,620 pounds of lead ore.

Ashcraft & Co. has a lease on two lots, operates one shaft at the 200-foot level, produced 184,000 pounds of zinc ore and 810 pounds of lead ore up to August, 1901, when it ceased operations.

Dell "C" Mining Co. has a lease on between four and five acres, one shaft worked at a depth of 203 feet, producing 786,000 pounds of zinc ore and 76,230 pounds of lead ore.

Old Lead Shaft. This lease embraces two acres and operated by A. Thomas, T. Caylor and A. Welch. One shaft was worked at the 110-foot level, from which was mined 208,310 pounds of lead ore.

On the McKinley lease there are five concentrating and two hand-jig plants, the equipment consisting of large 100-horse power boilers, 80-horse power engines, fourteen-inch crushers, with other machinery complete in every detail.

McMILLAN & RAYMOND.

Mr. W. C. McMillan is the Manager of the 30 acres controlled by the firm named, the same being located near Cave Springs. The Rowena Mining & Milling Co. having a lease from this company has one hoisting shaft and one air shaft on its lease. The Gold Standard has two working shafts. The Bonsteal Mining Co. has two working shafts, and lately completed a mill in which it began concentrating the ore. The production from the McMillan property shows for the year 3,306,000 pounds of zinc ore, which sold for $43,804.50. The improvements consist of three operating shafts, averaging 90 feet in depth, with three complete concentrating plants, seven steam boilers, five steam pumps, four steam hoisters, three crushers and six steam jigs.

MANHATTAN MINING COMPANY.

Controls 40 acres of land in the southwest of the southeast quarter, section 20, township 28, range 32. There are four shafts on the property with depths of 65, 70, 222 and 230 feet, respectively. Watson & Mehaffy operate one shaft, Sulivan & Young another and the third was operated by the Manhattan until April, 1901. During the year 342,240 pounds of zinc ore and 16,250 pounds of lead ore was mined by the Manhattan. The equipment embraces a complete concentrating mill, two boilers, two steam pumps, one air compressor, two steam hoisters, two horse hoisters, two crushers, two steam and two hand jigs. In addition to the production by the Manhattan proper, Sullivan & Young, lessees, produced 76,460 pounds of lead ore, while Watson & Mehaffy produced 45,040 pounds of lead.

MASSASSOIT LEAD & ZINC COMPANY.

The Massassoit Lead & Zinc Co. controls 95 acres of land located in the northeast quarter of the northwest quarter of section 14, township 27, range 33, within the city limits of Joplin.

This company does only a leasing and milling business. The sub-lessees are the *Friday Mining* Co., two shafts owned by Richards & Gardner; Leonard & Co., one shaft; John Marrs, one shaft; Four and Six Mining Co., two shafts; W. D. Mann (Olympia Mining Co.), one shaft; Wm. Coates (Ground Hog Mining Co.), one shaft; W. D. Mann (Dead Man Mining Co.), one shaft; Thos. Geary and the Little Bingo Mining Co., J. W. Creech. The output shows 1,984,000 pounds of zinc ore and 1,208,453 pounds of lead ore, which sold for $51,904.36. There were eight shafts of depths ranging from 30 to 120 feet which were operated. The equipment consists of one concentrating plant and three hand-jig plants, and all other appliances required for doing a large business.

MISSOURI LEAD AND ZINC CO.

This company has a capital stock of $300,000; bonds $150,000. It owns 1,200 acres of land in fee simple, 760 acres of which are in the corporate limits of the city of Joplin, lying south and east from a point three blocks east of the court house. Its president is Alexander Ross, its secretary and treasurer, Wm. F. Reed and its superintendent, H. R. Conklin. The company does not operate any of the mines on its property, but leases its land to operators who pay a royalty of twenty per cent on zinc ores, and twenty-five per cent on lead ores. In order to assist its lessees as well as to swell the output of its property, the company operates a pumping system and custom mill, the power being furnished from a central power house of 400 horse power capacity, using electricity for transmission. Seven large lift pumps are now in operation and the eighth at this writing being installed. One man on each shift is all that is required to care for and look after these pumps, while two men are employed on the day shift to keep up repairs. The custom mill is also furnished power electrically from the power house, and is run part full capacity or double shift, as may be required to handle all rough stuff in need of cleaning.

Of the forty-nine lessees on the property, thirty are producing ore, fifteen of them use hand jigs, while the remainder send their rough stuff to the company mill. During the year there was a production from the lands of this company of 12,134,876 pounds of zinc ore averaging $24.37½ per ton, 728,542 pounds of silicate which averaged $12.80 per ton, 4,631,200 pounds of lead at $46.03 per ton, and 11,290 pounds of drybone worth $20.90 per ton, making the total value of the product $234,868.29.

Among the producers on this property may be mentioned the Lennox Mining Co., Hegoda Zinc Mining Co., Frye & Co., W. M. Hall, W. H. Gross, Cowell & Co., McGavran, H. A. Walcott, Markenpax Mining Co., Cumberland Lead and Zinc Co., Norsworthy, Ingraham, C. A. Davis, Thornton, Randall, Dean and Montgomery.

Lennox Mining Co. owns and operates two leases on the Missouri Lead and Zinc Co., land located in Joplin, each lease covers the mineral rights on about fifteen acres and both have been good producers. Each lease is equipped with a mill, steam hoister and all necessary machinery for thorough and rapid mining. During the year the zinc ore product was 2,018,685 pounds, which averaged $26.35 per ton, and 1,251,560 pounds of lead ore, which sold for $45.96 per ton or a total of $55,367.29.

W. H. Gross & Co. are the operators on what is known as the Bessie G. Mining Co., and have a lease of five acres on the Missouri Lead and Zinc Co. property. This company has one operating shaft, 127 feet in depth, boiler and steam hoister. The output for a portion of the year was: zinc ore, 213,370 pounds, averaging $26.00 per ton, and 62,700 pounds of lead ore which sold for $45.00 per ton.

The Hegoda Zinc Mining Co. was incorporated July, 1901, and succeeded to a partnership known as Davis Clinton & Co. It operates a lease on four lots owned by the Missouri Lead and Zinc Co. This company has sunk its shaft from 135 to 196 feet and installed an 8-inch Cook pump. The dirt is cleaned at the mill of the Missouri Lead and Zinc Co. The output of zinc ore was 888,645 pounds which averaged $26.44 per ton, and 509,910 pounds of lead ore which sold for $46.33 per ton.

Cumberland Lead and Zinc Co., H. Collier, superintendent, owns a lease of 8 acres on the Missouri Lead and Zinc Co. property. It has a shaft 193 feet in depth and another 160 feet deep just completed. Mill has lately been completed and ready for work; the equipment consists of boilers, pumps, crusher and steam jigs. The output was 474,960 pounds of zinc ore, which sold for $27.32 per ton.

McGavaran Mining Co. controls, under lease, 7 acres of the Missouri Lead and Zinc Co. property, on which it has one shaft down 120 feet and is equipped with a hand jig plant, boiler, pump, steam hoister and crusher. The output was 220,000 pounds of zinc ore and 269,000 pounds of lead ore.

G. C. Norsworthy has a lease of 8 lots on the land of the Missouri Lead and Zinc Co., on which there is a shaft 180 feet in depth, boiler, pump and steam hoister. The output amounted to 1,900,000 of zinc ore which sold on an average for $26.00 per ton. There are a number of operators on the land whose production in the aggregate amount to considerable; but are not far enough beyond the prospect stage to admit of a detailed account.

MISSOURI ZINC FIELDS COMPANY.

This Company owns the fee to 440 acres of mineral land located in sections 17-19 and 20, township 28, range 32, and has a capital of $400,000 invested in land and plants. W. Spencer Hutchinson, general manager, with headquarters at Webb City. There are ten very complete concentrating plants and eight hand jig plants on the property, in addition to which there are eighteen boilers, one steam and two cornish pumps, two air compressors, thirteen steam hoisters, and two electric hoists, twelve horse hoisters, ten crushers, twenty steam jigs and eleven hand jigs and all in use. The output from this land was 11,195,-030 pounds of zinc ore, which averaged $21.74 per ton, and 1,083,485 pounds of lead ore which averaged $46.18 per ton, the total product bringing $146,685.10. The following concerns have secured leases from this company: Duluth Zinc Co., D. C. McConey, Old Colony Zinc and Lead Co., Oxford Mining Co., Bell & Co., Harrington Mining Co., Scioto Zinc Co., Bay Zinc Co., Owens & Co., White & Co., Marsh & Co., Haslett & Co., Montgomery & Co., Bacon & Co., Richelson & Co., Kizer & Co., Aug Wagner, Lewis & Co., White Duck Mining Co., J. M. Slaight, Snyder & Co., and Tantz & Co. The mines on this property have been heavy and steady producers, and with good prices may be expected to maintain its reputation.

MIDWAY MINES.

The Midway Mines embrace part of lots 1 and 2 in the northeast quarter of section 31, township 28, range 32, containing 10 acres. Weyman & McConey control the property and have two shafts in the ore at the 140-foot level; but work during the year has been greatly interferred with on account of the water resulting from worked out and abandoned mines surrounding them. On the land the following companies have been operating under a lease:

Doctor Mining Co. (formerly the Colorado) is now operating one shaft and one mill, Meyer and Noble owning the lease. The Next Week Mining Co. (formerly Bailey & Bacon) operated one shaft for a time, but have suspended work. McCord & Bolter (formerly Wheeler and Griffith) have in turn sold out and turned over the mill to new parties intending to commence work shortly. The output was necessarily small for reasons already furnished.

MISTLETOE MINING COMPANY.

The Mistletoe owns 40 acres of land in the northwest of the northwest quarter of section 8, township 29, range 32, near Neck City, some eight miles north of Carterville. It has for neighobrs the Old Colony on the north and Sphinx Mining Co. on the west. The following gentlemen, all of Carthage, Mo., own the property: Maj. Moore, J. W. Layne, McMillan, Sr., and Jr. and M. Lawrence.

The Big Kate has a lease from the Mistletoe and is the only lessee on the land producing ore; the equipment consists of one first-class concentrating plant, one steam boiler, one steam pump, one crusher and two steam jigs. The output shows 5,160,000 pounds of zinc ore, which sold for $69,015. The shaft operated is 185 feet in depth and the drifts show a fine face of free zinc ore with every indication that it will maintain if not exceed the splendid record already made.

NEELY MINING COMPANY.

The Neely is a newly organized company and controls 20 acres of land in the northwest of the northwest quarter of section 12, township 27, range 30. The fee to the land is in S. M. Hood. This is a comparatively new field and the work of development upon the land but fairly begun. The lease holders at present on this property are: McGowan Mining Co., one shaft 185 feet deep; Plymouth Rock Mining Co., shaft 225 feet deep; Doolittle Mining Co., sinking shaft to the 185-foot level.

The McGowan Mining Co., with headquarters at Reeds, Mo., has a lease from the Neely Mining Co., which covers four lots. The work of sinking a shaft commenced in 1900, being a deep shaft some time elapsed before it reached the depth of 182 feet, at this depth, however, a forty-foot face of zinc was developed in flint ground, a small per cent of lime and sparr being met with. The zinc ore assays 60 to 65 per cent. A complete concentrating plant was completed August 1, 1901, consisting of crusher, three sets of rolls, two sets of jigs, one 120-horse power boiler, two engines and a pump. Production on the lease has not been very large so far: but the future of this ground is one promising splendid turn-ins when fully developed. This land is eighteen miles due east of Joplin.

NORTH HEIGHTS ADDITION.

This property is so called because it embraces a large number of unsold lots in the above named addition to the city of Joplin. The fee to this 20 acres located as above belongs to D. H. Hart of Lincoln Illinois. Three shafts, 110, 130 and 140 feet in depth, were operated during the year, producing 566,625 pounds of zinc ore and 81,970 pounds of lead ore. The equipment consists of one concentrating and two hand jig plants complete, two boilers, one steam pump, three steam and one horse hoister. Mr. D. H. Baldridge has a lease on four lots and at present is operating three shafts, Mr. T. F. Yale of Joplin has charge of the property.

NORTH JOPLIN MINING COMPANY.

The original lease on this property was relinquished and the Henry "C" Mining Co., of Galena, Kansas, now has the lease. Possession was taken of the property in October last; since then five new shafts have been sunk and two old shafts made secure. The present owners of the lease intend developing the property to the point where it will attract small operators and do a leasing business only. In the development work horse hoisters were only used, 48,500 pounds of zinc ore and 11,300 pounds of lead ore was produced.

OLD COLONY ZINC AND SMELTING COMPANY.

This company owns 237½ acres of land located at Neck City, in addition to which it has 125 acres under lease. Mr. L. Winter is the manager of this property with postoffice address at Joplin. There are five shafts on the property, four of which have an average depth of 210 feet, while the other has the distinction of being the deepest shaft in the district, having been sunk to the 281-foot level. Drill hole here showed an ore body from 180 feet to 298 feet in depth. In the sinking of the deep shaft on this land a pump was not required until the 240-foot level was reached. The output from this property was 4,660,000 pounds of zinc ore and 145,690 pounds of lead ore, which sold for $55,975.81. The equipment embraces three mills of 100 ton capacity daily, twelve steam boilers, six steam pumps, one air compressor, eight steam hoisters, three crushers and six steam jigs.

OWENSBORO-JOPLIN MINING COMPANY.

This company controls 40 acres of land located in the northwest of the southeast quarter of section 6, township 27, range 32. Mr. G. Weyman is secretary of the company with postoffice address at Joplin, Mo. At one time Bailey & Stickney, Key West Mining Co., June Rose Mining Co., and the Quartette Mining Co. worked leases on this land. At present the Quartette only is operating, though considerable prospect work is being done. Work was prosecuted only a part of this last year with a production of 582,000 pounds of zinc ore.

OLYMPIA ZINC COMPANY.

This company owns a lease of 80 acres of land embraced in the north half of the east half of the northeast quarter of section 16, township 27, range 33. Four shafts ranging from 120 to 175 feet have been sunk on the property. This company had the misfortune of having its new and complete mill badly wrecked by a cyclone. Mr. W. W. White, vice-president, says that the company is engaged in sinking a new shaft and if a good body of ore is developed the company will rebuild its mill. 140,225 pounds of zinc ore was mined in the development work.

OXFORD MINING COMPANY.

This company is successor to the Chicago Lehigh Mining Co., and controls 200 acres of land one and one-half miles southwest of Carl Junction. Mr. James Story of Carl Junction, superintendent. The company does no mining on its own account; it operates pumps and drains the land for its tenants. The output from this land shows 8,681,000 pounds of zinc ore and 19,000 pounds of lead ore mined during the year. The plant consists of one complete mill, five hand jig plants, five boilers, four steam and two walking beam pumps, two steam hoisters, one crusher, one set of roughers 5 cell, one set of cleamers 6 cells. The following companies are at present operating under lease from the Oxford Mining Company:

Hazel, Mrs. Alice Raymond, operator. The Hazel has a lease of 6 acres from the Oxford Mining Co., it has one shaft down 100 feet and has produced 16,260 pounds of zinc ore. The equipment consists of one hand jig plant, one boiler, one pump and one steam hoister.

The Pee-wee, operated by Childs & Jacobs, has a lease on 5 acres, one shaft at 85 feet, and produced 60,560 pounds of zinc ore, equipment similar to the Hazel.

The Long-string, operated by H. E. Gerke, has a lease on 5 acres; shaft 100 feet in depth, equipped as the above mentioned and has so far produced 6,375 pounds of zinc ore.

The Cheap-screw, Taylor, Cox & Co., operators, have a lease on 5 acres of this ground and one shaft down to the 80-foot level, with an output from its development work of 302,830 pounds of zinc ore. It has one hand jig plant, boiler, pump and steam hoist.

Mastadon and Pelican is operated by the Young Bros. Mining Co. This company owns a 12-acre lease on the Oxford land. Aside from sinking three shafts 95, 100 and 115 feet in depth, but little so far has been accomplished. At the time this data was furnished the company was idle on account of a re-organization of the company. Two hoisting plants have been installed, one concentrating plant built, 6,000 feet of water flume constructed, together with a pumping plant equipped with gasoline engine and centrifugal pump. The output was 218,590 pounds of zinc ore.

The Gold Shield Mining Company has a lease on 10 acres. One shaft operated at a depth of 130 feet and still another shaft going down having reached a depth of 106 feet. The improvements embrace one hand jig plant, boiler, pump and two steam hoisters. There was produced during the year 1,246,925 pounds of zinc ore and 18,980 pounds of lead ore, which sold for $17,176.09.

"D" Shaft, operated by the Ishpeming Mining Co., has a lease on 10 acres, shaft operated at the 123-foot level. The equipment consists of one concentrating plant, boiler, air compressor, steam hoist, crusher, one set steam jig roughers 5 cell, and one set of cleaners 5 cell. The output from this ground was 2,176,230 pounds of zinc ore which sold for $29,267.17.

The Great Northern, operated by the Desplains Mining Company, owns a lease on 5 acres. During the year a complete concentrating plant was erected and 2,400 feet of water flume constructed. The output of this company shows 4,188,925 pounds of zinc ore, valued at $54,836.80. One shaft 103 feet in depth was operated.

Little Giant Mining Co., Arthur Miller, superintendent, has a lease on 5 acres and operates one shaft which is 65 feet deep. The equipment embraces a hand jig plant, boiler and steam hoist. The output from this mine was 918,915 pounds of zinc ore, which sold for $12,134.96.

The unclassified producers on the Oxford land produced 344,430 pounds of zinc ore, which sold for $4,188.38.

PERKINS ZINC COMPANY.

The Perkins Zinc Co. is incorporated under the laws of the State of Maine. D. Bradford Perkins, president, with postoffice address at Providence, R. I. This property is located at Zincite, has four shafts down to an average of 160 feet. The lease holders on this property are: Barker Brothers, English & Co., Tacoma MiningCo., and Perkins Zinc Co. The product shows 933,500 pounds of zinc ore, which sold for $14,000. During the year eight drill holes and two new shafts were sunk. A comparatively new and complete 100 ton mill, 100 horse power boiler, 75 horse power engine, three pumps, four steam hoisters, one horse hoister embrace the equipment.

PHELPS & CONNOR.

Mr. C. B. Lane of Webb City has a lease of 20 acres on what is known as the Connor land. He has one shaft down to the 185-foot level, and calls the mine Vanity Fair. The mine was not fully opened, but produced before the close of the year 55,000 pounds of zinc ore and 4,060 pounds of lead ore. The machinery consists so far of a hand jig plant, boiler and steam hoister.

PORTO RICO MINING COMPANY.

The property of this company changed owners December 1, 1901. Messrs. W. J. Ground, T. K. Irwin and James Luke now own and operate it. The property is located in section 34, township 28, range 32, and midway between Prosperity and Duenweg. The lease-holders on this tract are the Lucky Tom Mining Co., 3 shafts; Betts, 1 shaft; Boer Mining Co., 3 shafts; and I. & H. Mining Co., 2 shafts.

This tract has been a fine producer of both lead and zinc, the ore occuring in open ground requiring timber to make it secure. The promise for continued good production is most excellent; the production for the year being 3,256,000 pounds of zinc ore and 1,480,800 pounds of lead ore, selling for $73,420. During the past year two new mills were constructed. There are now four large and complete mills, three hand jig plants, nine steam boilers, three steam pumps, eight steam and six horse hoisters, eight steam jigs and seven hand jigs on the property. The company drains the ground and furnishes water for milling purposes.

PLEASANT VALLEY MINING COMPANY.

This company owns the lease to 40 acres of land located three miles southwest of Carthage, on which there are two shafts operated at an average depth of 180 feet. The ore is in sheet formation and of high grade, 1,200,000 pounds of zinc ore being produced during the year. The improvements on the property consist of one complete concentrating plant, three boilers, two pumps, two steam hoisters, crusher and steam jigs. Mr. Laurens Hull of Lima Ohio is the superintendent of the company, the local address is Carthage, Mo.

PERRY LEASE.

There are comprised in this lease 190 acres located at Lone Elm and in Wilson & Huttons addition to the city of Joplin. 66 lots on the Granby land in Lone Elm Hollow; 45 acres belonging to the Picher Lead Co., part *of Wilson* & Hutton addition to Joplin and 55 acres adjoining the last named addition on the west. There are three pumping stations on the lease and the water level maintained on the Granby land at the 160-foot level, on the Picher land at 130 feet and on the Wilson & Hutton land at the 145-foot level. The lease holders on the land are E. F. Very & Co., 1 shaft; Jaggers & Co., 2 shafts; Cofer & Eller, 1 shaft; J. W. Buttrum, 1 shaft; John Ferguson, 2 shafts; Dick Griffin, 2 shafts; Chas. Perry, 1 shaft; John Womas, 1 shaft, and Lee Nolan, 1 shaft. The total number of shafts on the land actually producing ore are twelve in number with depths respectively of 160, 140, 150, 68, 75, 48, 50, 74, 120, 130, 115, 110, 116. The production of ore for the year was 5,410,000 pounds of zinc ore and 834,390 pounds of lead ore, which sold for $110,343.07. The equipment in use during the year embraced two concentrating plants and twelve hand jig plants, six boilers, eleven horse hoisters, three crushers and four steam and thirty hand jigs.

RABBITS' FOOT ZINC MINING COMPANY.

This company controls 40 acres of mineral land near Central City, in section 7, township 27, range 33. Mr. T. L. Frothingham is the President of the company, with postoffice address at Joplin, Mo. One shaft 102 feet in depth was operated during the year, producing 2,320,000 pounds of zinc ore, which sold for $30,000.

The equipment consists of one complete concentrating plant, two steam boilers, one steam pump, one steam hoister, crusher and three steam jigs.

RANNABARGER MINING COMPANY.

Mr. A. Rannabarger, Treasurer and Manager of this company, reports his company as owning a lease of 30 acres in section 7, township 27, range 33, with the following companies as lease holders:

Hale Lead & Zinc Co., one shaft; John H. Rhyne Mining Co., three shafts; Ohio Mining Co., one shaft, and Withers & Co., one shaft. The Hale Lead & Zinc Co. are erecting a 125-ton concentrating plant, to be in operation May 1st.

J. H. Rhyne Mining Co. engaged in erecting a 100-ton mill, to be completed April 15th, 1902.

Ohio Mining Co. to commence the erection of a plant in May, 1902.

REGAN LAND COMPANY.

This company controls 80 acres in section 29, township 28, range 32, and is under the supervision of Mr. Sam H. Regan of Carthage, Mo.

The lease holders are Henry Madill & Co., one shaft; Todd & Co., one shaft; Grossland & Co., one shaft, and Fellows & Co., one shaft.

Theree shafts having and average depth of 150 feet were operated a part of the year, the production being small from each.

I. A. Mitchell & Co., one of the lease holders, operated a shaft 185 feet deep and appears to have produced the bulk of the output, having mined 365,380 pounds of zinc ore and 2,200 pounds of lead ore.

REX MINING & SMELTING COMPANY.

The Rex Mining & Smelting Company is the owner of 1,006 acres, known as the "Thousand Acre Tract," immediately adjoining the city limits of Joplin and described as follows:

The south half of section seven (7), the northwest quarter of the southwest quarter of section eight (8) and all of section eighteen (18), township twenty-seven (27), range thirty-two (32), in Jasper county, Missouri.

Lead ore was discovered in 1876 upon this tract at the grass roots by a charcoal burner, who was driving over it. A considerable quantity was taken out by him under a lease, but work was abandoned when water was encountered.

The present company was incorporated February 23rd, 1891, for the purpose of purchasing the tract. It is now owned in fee simple by this company free of all incumbrance.

The property was bought as a land investment only and the company has done no mining directly, but has adopted a system of leasing to actual miners. It, however, operates continuous drilling upon the ground for the purpose of discovering new prospects and also for the assistance of such lessesss who may desire such work done.

The little stream, known as Joplin creek, heads in about the center of this tract and the moderate elevation and numerous draws present a configuration which is favorable to the occurrence of ore. Sufficient development has already been made to indicate the existence of several well defined ore channels crossing the entire tract in a general north and south direction with numberous side channels or feeders.

Following is a statement of the production of ore for the years 1899, 1900 and 1901:

Date.	Lead ore, lbs.	Value.	Av. paid per 1,000.	Date.	Zinc ore, lbs.	Value.	Av. paid ton.
1899..........	1,199,010	$31,593 23	$26 34	1899.	5,255,420	$100,792 55	$38 34
1900..........	1,596,390	39,178 55	24 54	1900.........	4,132,510	54,538 39	26 39
1901..........	1,612,840	35,417 29	21 95	1901.........	2,370,970	27,817 34	23 48

The lessees on this property are first: The Consolidated Zinc & Lead Co., with most of the mines on the property under its lease. Other lessees are Newson & Co., A. D. Young & Co., H. A. Foster and John Lowry.

ROARING SPRINGS LAND & MINING COMPANY.

This company owns 208 acres of land just a mile south of the city of Joplin, in section 14, township 27, range 33. D. C. Hoover, Superintendent, with postoffice address at Joplin.

There are three mining companies operating under a lease, each having a shaft in the ore at 60 to 120 feet. The lease holders are the Devonshire, A No. 1 Mining Co. and the Penona Mining Co.

The output from this tract of land was 5,000,000 pounds of zinc ore and 559,280 pounds of lead ore, which sold for $77,024.52. There are two concentrating and one hand-jig plants, eight boilers, six pumps, ten steam hoisters and six horse hoisters, two crushers, five steam and eight hand jigs on the property.

The A No. 1 Mining Co. lease has been transferred to J. H. Myers & Co., who now operate the mine. There are four shafts on this lease, one 120 feet, two of 140 feet and one 145 feet in depth; but one shaft, however, was operated this last year and it produced 1,293,190 pounds of zinc ore and 443,740 pounds of lead ore.

SPHINX MINING COMPANY.

The Sphinx has a lease of 32 acres at Neck City, which, in its history, presents a rather paradoxical condition. This lease was obtained from the Cole-Ingersol Mining Co. at a royalty of 10 per cent, after which the Cole-Ingersol sub-leases from the Sphinx at a royalty of 20 per cent. This company began operations May 9th, 1898, and had produced to January 1st, 1902, 10,632,000 pounds of zinc ore, which sold for $148.-532.48. During last year (1901) the output was 4,160,000 pounds of zinc ore, which brought $53,405.71. Operations begun with the use of hand jigs and so continued until December, 1898, when a modern 100-ton mill was erected. This mill is supplied with material from two shafts. No. 1 shaft, 230 feet in depth, while No. 2 shaft, from which the pumping is done, is 250 feet in depth, with a 3-inch Snow pump handling the water effectivelly. This mine has three levels—110, 200 and 240 feet, respectively, in which there is enough ore in sight to last for years. In the bottom of the 250-foot shaft rich ore was struck and the drill proved ore at 300 feet. The ore from this property is of very high grade, averaging nearly 63 per cent zinc, some three or four car load lots having run *above 64 per cent.*

A number of lots have been leased on the 32-acre tract, with seven shafts in ore and two more being sunk. Two mills have just been erected and several others contemplated for the current year. The sub-lessees are the Neck City Mining Co., one shaft; Monti Cristo Mining Co., one shaft; Ruby Mining Co., one shaft; Great Oak Mining Co., one shaft; Cole-Ingersol Mining Co., three shafts.

The Cole-Ingersol and Neck City each own a newly constructed mill and the Monti Cristo now making preparation to erect a mill. Lead on this tract is found in very limited quantity, but the zinc deposits are heavy, many drifts being run in ore that show from 30 to 45 feet of ore.

The officers of the Sphinx Mining Co., are W. J. B. Stokes of Newton, N. J., President; C. A. Daniels of 409 Market street, Philadelphia, Secretary and Treasurer; J. B. Daniels, Superintendent, Neck City, Mo.

STUCKEY MINING COMPANY.

This property, consisting of 72 acres in section 25, township 28, range 34, near Bellville, has been leased by Mr. Calvin Stuckey of Zincite on a royalty of eight per cent and he in turn sub-leases on a royalty of 20 per cent. There are five shafts on the property having a depth ranging from 40 to 70 feet. The improvements embrace one concentrating and two hand-jig plants, four boilers, five pumps, three steam and four horse hoisters, one crusher, two steam and five hand jigs. The output was 300,000 pounds of zinc ore and 10,000 pounds of lead ore.

SULTANA MINING COMPANY.

This company is under the management of A. J. Baker of Joplin. It embraces a lease of 5 lots in the city limits of Joplin, and an investment of $8,000. The one shaft operated is 180 feet in depth and makes a very good showing as a producer, there having been mined during the year 2,490,590 pounds of zinc ore, which sold for $34,878.26. The improvements on the lease consist of a complete mill, steam boiler, two pumps, steam hoister and two steam jigs. This property promises to be a very fine producer and should not be surprised to find it doubling its output during the current year.

SHARPSBURG MINING COMPANY.

This company controls a lease of 40 acres of land in the southwest of the northwest quarter of section 22, township 28, range 32, with $12,000 invested in plant. The improvements on the property are a complete milling plant, two boilers, pump, air compressor and steam hoist. One shaft 225 feet in depth was operated during the year and from it there was hoisted 924,305 pounds of zinc ore, which sold for $20,324.84.

The officers and parties interested in the company are Geo. L. Walter, Treasurer; E. N. Dunlap, Secretary; W. M. Stenley, Superintendent; D. F. McIntosh, J. G. Wirtz and A. H. Laugherd.

SHORT CREEK MINING COMPANY.

This company, under supervision of Mr. P. H. Leddy of Joplin, controls a lease of 70 acres located at Central City, on which there are two shafts operated, one of which is 40 feet and the other 90 feet in depth. The output consisted of 290,000 pounds of zinc ore, 55,000 pounds of lead ore and 15,000 pounds of drybone. The equipment embraces simply two horse hoisters and eight hand jigs.

SOUTH JOPLIN LEAD & ZINC MINING COMPANY.

This company controls 40 acres of land within the city limits of Joplin, on the west side. The company does not mine on its own account, its operations being confined to a leasing business. Six mines were operated during the year, with shafts varying from 50 to 180 feet in depth. The output was 820,000 pounds of zinc ore and 120,000 pounds of lead ore. The lease holders, each of which have one shaft down, are J. M. Short & Co., Sowders & Graham, McManany Bros., Wilson & Coke, Hewes & Co. and Armington & Co. From appearances this tract should show for the current year a decided increase in its production.

SADTLER LEAD AND ZINC COMPANY.

This company owns the fee to 220 acres of land adjoining Duenweg on the south and located in section 10, township 27, range 32. During the year about fifty days only were employed in mining, the remainder of the time being taken up in development work. The lease holders are the Hudson Mining Co., with four lots and one shaft in lead. The Snodgrass has a lease of four lots with one shaft in lead. The Altona Mining Co. has a lease on 40 acres, with one shaft down 138 feet in good zinc ore and it looks like a fine prospect. The other two shafts are 20 and 77 feet, respectively.

SOUTH JOPLIN LAND COMPANY.

This company controls a 40-acre tract of land within the city limits of Joplin—Carter's addition. During the year the New York Superior operated one mine on this tract for a part of the time or up to June 1st, 1901, under a lease which the Superior holds on six lots in Carter's addition. During the period mentioned 462,600 pounds of zinc ore and 128,890 pounds of lead ore was mined when operations ceased and so remained for the balance of the year. From information since received it is likely the Superior and other companies will revive the work and a good production result for the current year.

TEN O'CLOCK MINING COMPANY.

This company has a lease of 10 acres of land located just three-fourths of a mile south of Prosperity, with Benj. C. Aylor of Webb City as Superintendent. The capital invested in plant amounts to $6,000, most of which has been expended in improvements during the year. A concentrating plant was finished September 15th, 1901, and during the year a shaft has been sunk, air drifts cut, pump shaft sunk from the 160 to the 170-foot level, and a hole drilled in the shaft from 165 feet to 212 1-2 feet, in the bottom of which a rich body of zinc ore was developed. There are four shafts on the lease, two of which are 170 feet deep, one 97 feet and the other sunk for a well is about 60 feet in depth. Lead is mined from the 97-foot level up, showing a 14-foot face of lead with blende in the bottom. The output shows 38,110 pounds of zinc ore and 1,619,520 pounds of lead ore mined, which sold for $38,267.18. Only one shaft was operated during the year and that was in the 97-foot shaft. Machinery sufficient for all purposes has been supplied.

TROUP MINING COMPANY.

This company is incorporated with a capital stock of $160,000 and owns the fee to 40 acres of very valuable mineral land surrounded by some of the most productive mines in the Carterville district. Four shafts having the depth respectively of 150, 180, 190 and 180 feet were operated during the year and the mines produced during the same time 3,544,180 pounds of zinc ore and 545,700 pounds of lead ore, valued at $58,812.29.

The following parties hold leases from the Troup: Ashcraft Mining Co., Newton Mining Co., Chicago-Joplin Zinc & Lead Co., Iowa Mining Co., Schaffer & Co., W. E. Patten & Co. There is also one tailing mill on the property. This tract of land is in section 21, township 28, range 32. Chas. P. Wallace is Superintendent, with postoffice at Carterville, near which point the mines are located. This property has been a good producer for years, as may be seen from the appended table:

Year.	Zinc, lbs.	Lead, lbs	Value.
1891	8,446,000	46,500	$97,283 47
1892	13,414,000	498,000	153,526 85
1893	1,225,970	456,400	18,482 91
1894	3,401,810	803,110	42,421 13
1895	485,400	550,600	54,477 05
1896	446,700	271,300	38,464 60
1897	3,344,000	28,820	31,537 26
1898	3,570,400	141,500	37,972 00
1899	2,537,000	312,510	66,793 86
1900	2,842,000	740,000	56,924 00
1901	3,544,180	545,700	58,812 00
Add six months, fiscal year ending June 30, 1900.	1,048,695	410,120	22,530 00
Total	44,305,875	4,807,560	$673,885 00

There are three complete concentrating plants, one hand-jig plant, seven boilers, two pumps, two air compressors, five steam and two horse hoisters, five crushers, six steam and two hand jigs on the property.

Mr. G. P. Ashcraft owns the lease on 7 acres of the Troup land, on which he has two shafts, one of which is used as a pump shaft. One shaft 180 feet in depth was used in reaching and hoisting 2,000,000 pounds of zinc ore and 246,590 pounds of lead ore during the year. On this lease there are one concentrating plant, one boiler, one air compressor, one steam hoister, one crusher and one set of steam jigs.

UNITED ZINC COMPANIES.

This company is organized under the laws of New Jersey with an anthorized capital of $6,000,000, of which $1,000,000 is preferred stock. William L. Lowell is President; Geo. M. Foster, Treasurer; James L. Clark, Secretary and General Counsel, and Franklin Playter, General Manager. The mines at Joplin are under the supervision of George H. Playter, while the mines of the company at Aurora, Lawrence county, are looked ofter by C. C. Playter.

No better evidence of the splendid management, sterling worth and great success of this company can be offered than the character of the information furnished the Inspector by this company for publication. What follows is like an open book recording its transactions for the information of all who may be interested directly or indirectly, information which in many instances would be considered strictly private, is given out so freely and uncerimoniously as to impress those especially who *gather statistics* with the honest intent and efforts of its management.

HOLDINGS OF THE UNITED ZINC COMPANIES, JOPLIN,

80 acres, fee simple, known as the Chitwood 80.

40 acres, fee simple, known as Turkland tract.

40 acres, 10-year 10 per cent lease, known as the Quincy lease.

Two concentrating mills with pumping machinery, together with the mines, mine equipment, machinery and tools belonging to and located on above mentioned fee. Three pumping plants are located on the leasehold mentioned.

Holdings at Aurora, Lawrence county, 84 1-4 acres, fee simple, known as Rinker land. Located on this land a complete concentrating plant, and all the machinery necessary to the successful operation of the mines on the land has been furnished.

NAMES OF LESSEES OR MINES IN JASPER COUNTY.

Chitwood Tract.

1. King Jack Mining Co., lots 1, 2, 25, 26.
2. North King Jack, lots 3, 4, 23 and 24.
3. Lawrence Mining Co., lots 5, 6, 21 and 22.
4. Saighman & Co., lots 7, 8, 19, 20.
5. Great Scott Mining Co., lots 9, 10, 17, 18.
6. Leedy Mining Co., lots 11, 12, 15, 16.
7. Lackawanna Mining Co., lots 13, 14, 39.
8. Ft. Wayne Mining Co., lots 36, 37, 38.
9. Ft. Wayne Mining Co., lots 40, 41, 42.
10. Saighman & Co., lots 35, 43, 44.
11. Saighman & Co., lots 33, 34, 45.
12. Pelican (operated by United Zinc Co.'s), lots 31, 32, 46, 47, 48.
13. Conqueror No. 1, lots 29, 30, 49, 50.
14. Conqueror No. 2, lots 27, 28, 51, 52.
15. Conqueror No. 3, lots 53, 54, 77, 78.
16. Silver Shield, lots 55, 56, 75, 76.
17. Pelican Reserve, lots 57, 58, 73, 74.
18. Murphy, Friel & Co., lots 59, 60, 71, 72.
19. Cock Robin (oper. by United Z. Co.'s) lots 61, 62, 63, 68, 69, 70.
20. Cock Robin Reserve, lots 64, 65, 66, 67.

Turkland Tract.

1. The Germania, lots 16, 17, 18, 19, 20, 21, 22, 23, 24.

Quincy Leasehold. Sub-leased to J. E. Hunter, Trustee, who in turn has leased out to the following:

Lewis & Co., south one-half of 4 and all 5, 15, 16, 23 and 24.

Wiltermood & Co., 31 and 32.

Jones, Cassiday & Co., north one-half, 29 and 30.

Wiltermood & Co., 49 and 3½ of 30, except 30 feet off east side.

Tidd & Adams, 3, 17, 50, 51, south one-half of 29 and 30 feet off east side of 49 and south one-half of 30.

Wm. Wiltermood, 23 and 24.

ROYALTY.

All of the leases on the Chitwood tract pay 20 per cent royalty on the gross output of both zinc and lead.

The Germania on the Turk land is a 15 per cent lease. The sub-lease on the Quincy leasehold is at the rate of 15 per cent.

The Chitwood leases run from 8 to 10 years, all of them having been for a ten-year term when executed.

The Germania lease is a new lease for ten years, made last fall.

On the Quincy the term of lease expires with the expiration of the first lease to the United Zinc Companies.

SURFACE IMPROVEMENTS.

There are eight mills in operation on this property besides several hand-jig plants, pumping stations, etc., with one more mill that will be ready for operation within six months.

Following is a table showing capacity for day of 10 hours of present plants in tons of mine rock:

Name of mine.	Plants.	Capacity per shift.
King Jack	Mill	125 tons
Conqueror	Mill	125 tons
Silver Shield	Mill	100 tons
Pelican	Mill	125 tons
Cock Robin	Mill	125 tons
Hoosier	Mill	125 tons
Lackawanna	Mill	125 tons
Great Scott	Mill	125 tons
Murphy, Friel & Co	Hand Jigs	25 tons
Quincy	Hand Jigs	50 tons
Germania	Hand Jigs	25 tons
		1,075 tons

PERSONAL PROPERTY.

Of the above described plants, the following only belong to the United Zinc Companies, the balance being personal property of our various lessees:

Pelican, mine and mill.

Cock Robin, mine and mill.

Quincy lease, machinery and pumps (leased).

Germania, machinery and pumps (leased).

The Pelican mill has a daily capacity of 125 tons. The mill was built in September, 1899, and is one of the best of its size in the district; 200-horse power battery of boilers, 50-horse power automatic engine, large size jigs, rolls and crusher. Ore is supplied from two shafts, one dumping direct on ore platform, the other connected with mill by overhead tram 200 feet long.

At the Pelican mine, situated as it is near the center of the 80, the company has its scales, mine office, powder house, oil house and general store house.

The Cock Robin equipment is very similar to that of the Pelican, except that large ground pumps are in use, as the strongest water in Chitwood is there encountered. Two shafts here also furnish the ore for the mill.

The above mines and mills are operated by the company.

In the case of the "Quincy" and the "Germania," however, the United Zinc Companies own the machinery, but have same rented to parties operating above leases. The manchinery at the Quincy consists of one 40-horse power boiler, one 30-horse power engine, two double-gear Cornish lift pumps, one string pump, belt hoister, buildings and jig tanks.

At the "Germania" nearly a duplicate of above equipments.

All of the other plants mentioned above (property of lessees) are mondern in equipment, but of usual type; crusher, two to three sets of rolls, "rougher and clearner" steam jigs. Boiler plants in every case are large, owing to use of air and steam rock drills in ground. Where ventilation is good, steam is sometimes used in the place of air. Mill buildings are all large and substantial and in every way equppied for the most economical handling of the ore.

The Memphis railroad has switches to the bins of every plant on the Chitwood 80, and stands ready to extend spurs whenever and wherever the management desires. This makes a great saving in coal and timber transportation and gives the company the best market possible for its ore, as it has all the advantages possible in a short wagon haul.

The City Water Works has extended its mains to the prancipal plants and are making low rates on water for boiler purposes. The water problem from a drainage standpoint is not a factor here. In fact the company has been short of water for milling purposes and a co-operative water company among its lessees has been formed with pumping station on Turkey creek, half a mile to the north of the Chitwood land, which furnishes all the water needed at minimum expense.

In most instances the ore is free, even in the hard ore mines of the property and consequently is easily cleaned and brings the higest market price. A lime cap rock is found in most of the mines that permits of carrying large drifts and of leaving small pillars. In some places faces or stopes from 75 to 100 feet high are worked. Where ground requiring timbering is found, as at the Pelican, there is still a roof that holds until air slacked, and the timbering is more for the protection of the miners than as a matter of necessity for the protection of the mines. In most cases the sinking to the ore body is expensive, but once opened, the conditions here are more favorable than in many camps in the field. Above applies to the Chitwood 80.

On the Turk 40 and Quincy lease different conditions exist; the ore is shallow and more irregular. It is more of a poor man's camp, for the reason that a shaft can be sunk almost anywhere in that neighborhood for from $2.00 to $3.00 per foot to a depth of 100 feet. The ore bodies being scattered are in most cases very rich, the ground is open and drains readily to one or two pumping stations.

ORE DEPOSITS.

The Chitwood 80 has been very thoroughly prospected and present stage of development is well advanced. There are 19 shafts from 90 feet to 195 feet deep and over 80 drill holes from 150 feet to 350 feet deep. Twelve of these shafts are now being worked producing ore, three are sinking, and prospecting in the remaining four is being done in the way of drifting. Over 50 per cent of the drill holes have found ore in paying quantities. Every lease on the ground is being worked, ore being turned in regularly from eleven of them.

The King Jack has ore from 90 feet to 148 feet, as already developed. Present work is being done on the 128-foot level, with main ore chute about 45 feet wide. Mine rock yields from 10 per cent to 15 per cent concentrates. Main shaft is on south lots of lease, while drilling has shown same ore to exist 600 feet further north on same property.

The Conqueror has shafts on each of its leases, the deepest being 150 feet. Ore is taken from all of them at present. Deposit seems to be very general over the major part of its lease, following no sharply defined shutes. Faces opened at present vary from 40 feet to 70 feet in height, and drifts are carried about 40 feet wide. Extensive drilling shows large reserve of ore. Mine rock yields about 5 per cent blende.

The Silver Shield is almost identical in formation to that of the Conqueror adjoining. Property is not so well developed, however, the shaft only being 125 feet deep and one drift being worked at the 90-foot level at present.

The Pelican has two shafts, one 158 feet, the other 170 feet deep. Ore body is large, commencing at 90 feet and continuing to a depth of 165 feet. Shutes as developed average about 40 feet in width, occasionally opening into larger "rooms," varying from 60 to 90 feet in width. Drilling shows ore body to be very extensive; larger bodies of ore are blocked out here than in any other mine on the property. Mine rock yields about 5 per cent concentrates.

The Great Scott mine has shaft 185 feet deep, with ore from 108 feet to 170 feet in drill hole and at shaft. Cross cut 60 feet has not found west wall. Mine has just been opened, but indications point to a large body of ore. Mine rock yields 9 per cent concentrated lead and blende.

The Lackawanna and Hoosier are both new mines. Both have good ore bodies as far as developed, varying from 20 feet to 40 feet in width and from 20 feet to 30 feet in height. Mine rock in each yields about 5 per cent concentrates.

Other shafts and drill holes on property indicate large and paying deposits, all of them of a much less pockety nature than is usually in the Joplin field. On one of the Saighman & Co. leases another mill will be constructed during the summer.

The concentrates vary from 59 per cent metallic zinc at the Lackawanna to from 62 to 63 per cent at the Pelican and King Jack. There is practically no iron in the ore in any part of the property. The Chitwood property is new, the first turn-in being in 1895, as shown by statistics below. Not until 1899 was any extensive development started; since that time, as shown by dates below the increase has been rapid:

Date.	Zinc.	Lead.	Value.	Zinc, tons.	Lead, 1000 lbs.
1895	101,240	7,950	$1,280 49	$22 00	$17 50
1896	1,832,010	739,060	30,197 31	21 50	15 00
1897	3,880,882	1,700,475	76,910 70	21 50	20 00
1898	3,144,247	539,600	54,770 27	27 25	22 25
1899	5,622,245	594,010	128,863 93	41 25	26 00
1900	11,875,576	11,398,864	197,868 19	28 75	24 49
1901	21,892,000	1,854,000	332,711 00	26 50	23 00
	48,348,200	6,734,959	$822,601 89		

CHITWOOD HOLLOW LEASE.

The King Jack mine on the United Zinc Companies' land is one of the very good ones in this great producing district. The operators of this mine have named their company the King and Queen Mining Co., with Mr. Bud M. Robinson as Superintendent, with postoffice at Joplin. While the output of the mine this year has not been as great as that of some other mines in the locality, yet the reason for this is easily accounted for from the fact that prices were considered too low and single shifts run instead of double, and frequently no shift. The mine has a large development work ahead in addition to the sinking of two new shafts and their complete equipment with the necessary machinery. No better idea can be given of this mine than the statement that every expense, including development work done, shows a cost of but $11.77 per ton for the ore delivered in the bins ready for shipment; this is a record seldom, if ever, equaled, when length of time in which the record was being made is considered. The mine at the time of making this report had more ore in sight than at any time previous and gave promise of breaking all records during the year 1902. This mine produced last year 4,724,000 pounds of zinc ore, which brought on an overage of $27.50 per ton, and 283,200 pounds of lead, which averaged $45.00 per ton. There are three shafts on the property with depths of 160, 165 and 125 feet, respectively, only one of which was operated during the year, the other two being new. The equipment consists of one concentrating plant, three steam boilers, three steam pumps, three steam hoisters, one horse hoister, one crusher and two steam jigs. The mine is under excellent management.

The C. C. & Cock Robin embrace three shafts on the U. Z. Co.s property having a depth of 90, 138 and 165 feet, respectively. The lessees on this property having changed frequently during the year, no attempt has been made to keep track of them; but as the mine rock was bought and milled by the U. Z. Co., the output has been secured without trouble. The product consists of 560,180 pounds of zinc averaging $25 per ton, and 200,225 pounds of lead averaging $46.00 per ton. Equipment embraces one concentrating plant, one hand-jig plant, three boilers, three pumps, three steam hoisters, one crusher, two steam hoisters and two hand jigs.

The Lackawanna Mining Co. operates two shafts on the U. Z. Companies' ground, average depth of the shafts being 140 feet. This mine is under the management of Mr. W. S. Mears, who is General Manager. The company is composed of Scranton, Pennsylvania, capitalists and control under lease three lots. The mine shows a big face of excellent ore, and at no time did it appear to better advantage than at the latter part of the year when we visited it. The ground requires a certain amount of timbering to make it safe. The output of zinc ore amounted to 4,935,878 pounds, bringing and average of $26.16 per ton, and 665,400 pounds of lead, which brought on an average of $46.44 per ton. The equipment consists of one concentrating plant, three boilers, four pumps, one air compressor, two steam hoisters, one crusher and three steam jigs.

Conqueror Zinc and Lead Co., Wm. Houck, President and Treasurer. This company has a lease of 16 lots on the United Zinc Companies' property, and operates three shafts having a depth of 115, 145 and 160 feet, respectively. The output for the year shows 3,286,000 pounds of zinc ore, which sold for an average of $27.00 per ton, and 130,070 pounds of lead, which brought $46.00 per ton. The equipment consitsts of one concentrating plant, two boilers, three pumps, three steam hoisters, one crusher and two steam jigs. This has been a good producing property, and with better prices the output will be greatly increased.

The Pelican mine is located on a tract containing 9 1-2 lots or about 10 acres. This mine is owned and operated by the United Zinc Companies, and during the year it has sunk shaft No. 2 from 150 feet to 165 feet; also a new shaft known as No. 3 from the surface to a depth of 165 feet. It has installed a new 80-horse power boiler, 150 light electric plant, enlarged platform, erected new derrick and built tramway from No. 3 shaft. The ground in this mine is soft, requiring very heavy timbering and in no other mine in the district will the size and extent of the timbering compare with it. The ore is found in gray spar ground, is exceedingly rich in this mine and its percentage runs high. During the year it produced 4,487,440 pounds of zinc, which averaged $26.00 per ton, and 205,600 pounds of lead ore, which averaged $46.50 per ton. The equipment consists of a 125-ton mill, complete in all respects, three boilers, two boiler feeders and two ground pumps, three steam hoisters, one fourteen-inch crusher and three steam jigs.

Deep Rock Mining Co. has four lots leased from the United Zinc Companies. The parties composing the Deep Rock Mining Co. are H. O. Bullard, I. K. Simons, Edw. Cox, Wm. Brultman, G. B. Bosworth and Mr. Short. This company commenced its prospect work in August and commenced producing about the 1st of November. The output, considering the short time it was operated, shows well and promises a bright future, the product showing 12,000 pounds of lead ore and 747,080 pounds of zinc ore. The shaft is 165 feet in depth, the equipment consisting of a mill complete and the required machinery to do a good business.

Ft. Wayne Mining Co. has a lease of 7 acres in Chitwood Hollow belonging to the United Zinc Companies. One shaft has been sunk and operated at a depth of 195 feet and during the year the company completed a large concentrating plant; the other equipment consists of two boilers, one pump, one air compressor, one steam hoister, one crusher and three steam jigs. The output of 831,850 pounds of zinc ore averaged $25.00 per ton and 8,240 pounds of lead, which sold at $46.50 per ton.

L. A. Saighman & Co. has a lease of 8 acres on the Chitwood 80-acre tract belonging to the United Zinc Companies. This company has just completed a $15,000 concentrating plant and is equipped otherwise with good machinery for excavating and handling the product of the mine. The output for the year shows 2,113,570 pounds of zinc ore mined. which averaged $25.00 per ton, and 214,260 pounds of lead ore, which sold for $46.00 per ton.

DESCRIPTION AND LOCATION OF PROPERTY.

The United Zinc Companies own in fee four different tracts of mineral land, two being situated in Jasper county, Missouri, and one (1) in Newton county, and the fourth in Lawrence county, Missouri, and they are described as follows:

All the east one-half of the southeast quarter (1-4) of section thirty-two (32), in township twenty-eight (28), north of range thirty-three (33), west, in the township of Galena, in the county of Jasper and the State of Missouri.

This tract lies about two and a half (2 1-2) miles northwest of the central part of the city of Joplin, Missouri, and is generally known as the Chitwood Hollow tract.

A description of the improvement and developments are particularly set forth in the report, which is submitted herewith.

The second piece of mineral land owned by this company is described as all that part of the northwest quarter of the northeast quarter of section twelve, and all that part of the northeast quarter of the northeast quarter of section twelve (12) lying west of the right of way of the Missouri Pacific Railway, all being in township twenty-seven (27), range thirty-three (33), containing forty (40) acres more or less in the township of Joplin, county of Jasper, State of Missouri.

This tract of land lies about a mile and a half (1½) east of the central part of the city of Joplin, and its improvements and developments are particularly described in said report, which is submitted herewith. herewith.

The third tract is described as the east one-half of the southwest *quarter and the west* one-half of the southeast quarter of section 27, township 27, range 31, in Newton county, Missouri, and is known as the Diamond land.

This tract has recently been purchased and has not been platted into mining lots, and lies eight miles east and south of the city of Joplin, Mo.

The fourth tract of land consists of eighty-seven and fourteen hundredths (87 14-100) acres more or less situated in the county of Lawrence, State of Missouri, and more particularly described as follows:

All the northwest quarter of the southeast quarter and the north half of lot No. 1, of the southwest quarter and seven and fourteen hundredths (7 14-100) acres off the east side of the north half of lot No. 2 of the southwest quarter, all in section seven (7), in township twenty-six (26), north of range twenty-five (25).

This piece of land joins the corporate limits of the city of Aurora, in Lawrence county, on the east, it is known as the Rinker tract. Its improvements and developments are particularly described and set forth in the report herewith submitted:

STATEMENT OF MINE PROFITS OF U. Z. COMPANIES.

July 1st, 1900, to December 7th, 1901.

Year	Months.	Location.	Mines.	Royalties.	Expense.	Net.
1900..	July, Aug. and Sept..........	Joplin.....	$16,403 93	$8,241 20	$1,435 49	$23,209 64
		Aurora.....	....	2,431 24	600 87	1,830 37
	Oct., Nov. and Dec..........	Joplin.....	3,844 36	8,030 47	1,572 61	10,302 22
		Aurora.....	.. ..	4,448 27	408 80	4,039 47
1901..	Jan. Feb. and Mch...........	Joplin.....	9,829 74	11,365 48	1,273 56	19,921 66
		Aurora.....	....	6,884 64	650 00	6,234 64
	Apr , May and June...........	Joplin.....	7,919 26	13.998 91	1,321 33	20.543 42
		Aurora.....	....	4,073 45	1,411 73	2,661 72
	July, Aug. and Sept....	Joplin.....	2,409 48	12,758 41	1,172 28	13,995 61
		Aurora.....	....	2,786 24	761 05	2,025 19
	Oct., Nov., Dec. 7th...........	Joplin.....	4,685 92	9,618 88	870 06	13,434 74
		Aurora.....	....	1,353 81	816 99	536 82
			$45,092 69	$85,991 00	$12,294 77	$118.735 50

Since the above was written the United Zinc Companies has purchased largely of lands in the vicinity of Duenweg.

The production from the United Zinc Companies properties in Jasper and Lawrence counties, from July, 1900, to December 7th, 1901, has been as follows:

JOPLIN.

Year	Months.	Zinc.	Lead.	Value.
1900..	July, August and September..........................	4,477,620	406,694	$71,039 99
	October, November and December..................	2,459,630	388,200	42,851 15
1901..	January, February and March......................	6,176,160	332,020	87,961 99
	April, May and June..................................	6,480,920	507,312	95,951 73
	July, August and September..........................	5,532,810	516,995	85,061 93
	October, November and December 7th.............	2,891,340	304,460	45,661 15
	AURORA.			
1900..	July, August and September..........................	1,759,830	30,880	17,249 44
	October, November and December..................	2,734,120	6,450	31,324 40
1901..	January, February and March......................	4,857,960	5,480	51,704 53
	April, May and June.......	2,828,050	57,860	32,822 00
	July, August and September..........................	2,231,920	52,720	21,068 29
	October, November, December 7th..................	1,300,010	33,225	13,802 29
		43,730,370	2,642,296	$596,518 74

VENTURE MINING COMPANY.

This company is successors of the Three Friends Zinc Mining Co., having purchased the fee and lease at a sale which was made of this property under a deed of trust December 3rd, 1901. Mr. Joseph W. Lewis, of 421 Olive street, St. Louis, was president of the original company, but is now secretary of the Venture. The land controlled by this company embraces 320 acres, 160 of which is owned in fee and the remaining 160 is leased, all of which lies in parts of sections 13, 14, 23 and 24, township 28, range 34, two and one-half miles southwest of Carl Junction. At the time of the sale of the property all former lease holders forfeited.

The output during the year shows 1,138,000 pounds of zinc ore and 2,000 pounds of lead ore mined. There are two shafts 150 and 165 feet respectively that were operated, with an equipment consisting of a complete concentrating plant, three boilers, two pumps, two steam hoisters, one crusher and five steam jigs.

WADDELL & COMPANY.

Formerly known as the Migonette Mining Company, embraces 24 acres of what was known as the Hall land six miles northwest of Carthage; T. J. Waddell, superintendent, with postoffice address at Carthage. The output for the year shows 3,142,000 pounds of zinc ore, which *sold for $41,952.87*. One shaft, 175 feet in depth, was operated with an equipment consisting of one concentrating plant complete, two boilers, two steam and one 10-inch lift pumps, one steam hoister, one crusher and two steam jigs. This mine promises to be an extra good producer.

WITCH HAZEL MINING COMPANY.

The Witch Hazel lease is owned by Mr. A. B. McConnel of Joplin. This lease formerly covered the 40 acres in the southeast of the northwest quarter of section 6, township 27, range 32. The south 30 acres was surrendered and is not now being worked.

Moore & Co., under a lease, operates one mine, the shaft being 90 feet in depth; horse power and hand jigs only being employed. The output shows 44,000 pounds of zinc ore and 7,750 pounds of lead ore, only 50 days having been employed in mining, though considerable time was occupied in development work.

WRIGHT MINING COMPANY.

The Wright Mining Co., under the management of Mr. F. L. Yale, controls a lease of 22 acres in the east one-half of the southeast of the southeast quarter of section 32, township 28, range 33, two miles northwest of the city of Joplin. This company pays a royalty of 10 per cent, but receives a much better per cent from its sub-lessees. The lease holders are the Jim Jackson Mining Co., and the Charter Oak Mining Co. The equipment consists of two concentrating plants, two boilers, two pumps, two steam hoisters, one crusher and steam jigs. The production during the year was 1,318,000 pounds of zinc ore and 17,710 pounds of lead ore, which sold for $17,006.05.

The Jim Jackson Mining Co. owns a lease to five acres of the Wright land, and operated one mine during the year, reached by a shaft 185 feet in depth. The output of this mine shows 1,246,590 pounds of zinc ore mined and which sold for $14,761.52. On this five acres the improvements consist of a complete mill, steam pump, boiler and hoister.

WILLAPUS WALLAPUS MINING COMPANY.

This company is under the management of Mr. W. P. Howard, with postoffice address at Howard, Jasper county, Mo., and owns 28½ acres of land in the southwest of the northwest quarter of section 2, township 27, range 34. The equipment consists of a horse hoister and two hand jigs. One shaft down 75 feet was operated very indifferently during the year; the output showing 16,120 pounds of zinc ore and 3,820 pounds of lead ore. Considerable development work was done, however, with sufficient demonstration of the ore to justify the opinion that the property will prove a very good producer under a progressive management.

YALE & O'BRIEN.

Messrs. Yale & O'Brien own the lease on 40 acres of land in section 32, township 28, range 33. Four shafts have been sunk, but two mines were operated during the year, producing 492,000 pounds of zinc ore and 280,140 pounds of lead ore. The following hold leases from Yale & O'Brien: Cyclone Mining Co., Consolidated Zinc and Lead Co., and C. H. King. The equipment embraces two hand jig plants, three steam boilers, one pump, three steam hoisters, two crushers, one steam and five hand jigs. Mr. F. L. Yale is superintendent of the property, with headquarters at Joplin.

TABLE II.

Showing production and values in Jasper county by local districts.

JOPLIN.

Name of Company.	Pounds of zinc ore.	Pounds of silicate.	Pounds of lead ore.	Pounds of dry-bone.	Value of all ores.
Ajax Mining Company	1,406,000		86,000		$19,864
American Zinc, Lead and Smelting Company					
" " " Interurban Tract	1,172,000	11,000	21,000		14,595
" " " Lone Lady Tract	298,000		8,000		3,733
" " " Midway Tract	5,732,000	71,000	104,380		66,751
" " " Missouri Central Tract	138,000		51,000		2,889
" " " Porter Tract	72,000	16,000	44,000		1,816
Arkansas Mining Company	154,000		20,000		2,567
B. and O. Mining Company	1,154,000				15,002
Bankers Land	8,000				96
Barbee & Yale	240,000		433,000		13,697
Bay State Zinc Company	1,574,000		543,000		33,078
Becky Sharp Mining Company, scrapper work	31,000		74,000		2,104
Big Bug Mining Company	2[illegible],000				350
Binghampton Zinc and Lead Mining Company	107,000		66,000		2,796
Boqua Mining Company	2,988,000		6,000		38,812
Budweiser Mining Company			48,000		1,198
Colonial Zinc and Lead Company	52,000				608
Colorado-Joplin Mining Company	350,000		96,000		7,187
Continental Zinc, Lead and Smelting Company	13,554,000		312,000		189,816
Dinkelbeihler lease	1,066,000		64,000		16,606
Excel Mining and Prospecting Company	560,000		48,000		8,778
Empire Zinc Company	1,110,000		288,000		18,908
Estrada lease	2,862,000				40,233
Gilchrist Porter Realty Company	1,132,000		384,000		24,000
Granby Mining and Smelting Company	16,164,000		4,266,000		293,881
I Know Mine	94,000		118,000		3,811
Imperial Mining Company	1,760,000		8,000		24,399
Independence Mining Company	1,208,000				16,634
Indiana Mining Company	26,000		2,000		345
Jeannette Mining Company	528,000		434,000		16,565
Joplin Prospecting Company	522,000		76,000		8,515
John Jackson Mining Company	3,480,000				42,191
Jack Johnson Mining Company	1,090,000				14,049
Jim Jackson	1,246,000				14,762
Lead Hill Mining Company	1,452,000		6,000		16,253
Leonard Mercantile & Realty Company	6,268,000		1,272,000		97,615
Leckie Mining Company	166,000		82,000		3,269
McConnell Mining Company			76,000		1,678
Massassoit Mining Company	1,984,000		1,208,000		51,906
Missouri Lead and Zinc Company	10,136,000	728,000	4,830,000	12,000	234,868

TABLE II—Continued.

Name of company.	Pounds of zinc ore.	Pounds of silicate.	Pounds of lead ore.	Pounds of dry-bone.	Value of all ores.
Montgomery Lead and Zinc Company	938,000		1,500		11,299
Mohaska Mining Company	66,000		118,000		3,506
North Heights Mining Company	776,000		86,000		11,631
North Joplin Mining Company	48,500		12,000		883
Olympia Zinc Company	144,000		8,500		1,847
Owensboro-Joplin Mining Company	582,000				7,243
Perry Lease	5,410,000		1,835,000		110,343
Plymouth Rock Mining Company	1,854,000				23,434
Quaker Mining Company	1,800,000				24,000
Rannabarger Minning Company	12,000		6,500		293
Rex Mining Company	1,612,000	50,000	2,306,000	64,000	72,270
Roaring Springs Mining Company	5,000,000		558,000		77,029
Sergent Mining Company	310,000				4,185
South Joplin Land Company	820,000		120,000		11,810
South Joplin Lead and Zinc Company	728,000		130,000		11,087
Spencer, C. H	594,000				6,917
Sultana Mining Company	2,490,000				34,878
Triad Mining Company	252,000				3,276
United Zinc Companies	21,892,000		1,854,000		332,024
Warren Lead and Zinc Company	286,000				4,000
Wright Mining Company	1,318,000		18,000		17,012
Yale & O'Brien	492,000		280,000		12,267
Mines worked part of year now out of business	4,182,400		648,000		86,354
Sludge Mills and Chatters not otherwise reported	5,698,000		140,000		61,608
Weyman & McConey	392,000				3,793
Witch Hazel Mining Company	44,000		8,000		682
West Joplin Mining Company	1,004,000		6,000		12,785
	140,596,900	876,000	22,956,406	76,000	$2,306,504

WEBB CITY AND CARTERVILLE.

Name of company.	Pounds of zinc ore.	Pounds of silicate.	Pounds of lead ore.	Pounds of dry-bone.	Value of all ores.
Aida Mining Company No. 1	2,610,000		76,000		$35,679
American Zinc, Lead and Smelting Company					
" " " Cornfield Tract	19,856,000		3,538,350		304,761
" " " Richland Tract	1,418,000		567,000		29,441
" " " Davey Tract	4,248,000		1,314,000		80,258
Ashcraft & Reynolds	16,000		6,000		340
Beckwith Hall Mining Company	1,600,000		250,000		24,187
Blue Wing Mining Company	1,120,000		316,000		20,889
Bradford Kansas City Mining Company	608,000		61,000		7,062
Brinkley Lease	86,000		4,000		1,041
Burgner Mining Company	368,000		314,000		10,336
Center Creek Mining Company	15,114,000		1,308,000		188,672
Davey & Son	3,552,000		1,028,000		60,886
Della S. Mining Company	400,000				6,000
Eldorado Mining Company	2,530,000		760,000		43,638
Eleventh Hour Mining Company	4,280,000		934,000		68,968
Forestal & O'Donald	1,206,000		140,000		19,894
Funk & Bowman	56,000		28,000		1,255
Homestead Zinc and Lead Company	3,904,000		394,000		59,889
Investors Mining Company	928,000		210,000		14,214
Katy C. Mining Company	1,748,000		2,500		25,403
McKinley Mining Company	9,932,000		526,000		136,311
Manhattan Mining Company	342,240		140,000		7,332
Missouri Zinc Fields Company	11,196,000		1,084,000		146,708
Phelps & Conner	56,000		4,000		854
Regan Land	435,000		23,000		5,269
Sharpsburg Mining Company	924,000		426,000		21,330
Troup Mining Company	3,544,000		546,000		60,402
Woodward Mine	2,000,000			246,000	25,451
Mines worked part of the year now defunct	3,798,000		430,000		57,568
Sludge, Mills & Chatters, not otherwise reported	3,570,240		92,000		41,072
	101,445,480		14,521,850	246,000	$1,505,100

ORONOGO.

Name of company.	Pounds of zinc ore.	Pounds of silicate.	Pounds of lead ore.	Pounds of dry-bone.	Value of all ores.
American Zinc, Lead and Smelting Company, Center Valley Tract	7,494,000		564,644		$98,602
Granby Mining and Smelting Company	25,862,000		902,000		344,639
Parker & Johnson	602,000		15,000		7,936
	33,958,000		1,481,644		$451,177

TABLE II—Continued.

Name of company.	Pounds of zinc ore.	Pounds of silicate.	Pounds of lead ore.	Pounds of dry-bone.	Value of all ores.
DUENWEG.					
Big Six Development Company	4,839,000	....	46,000	....	$58,549
Bolton-Duenweg Mining Company	1,937,000	....	1,056,000	....	41,628
Crown Crest Mining Company	160,000	400,000	1,040,000	248,000	31,215
Lucky Tom Mining Company	2,700,000	....	300,000	....	33,825
Porto Rico Mining Company	3,256,000	....	1,482,000	....	73,431
	12,892,000	400,000	3,924,000	248,000	$238,648
CARTHAGE.					
Hudson Mining Company	1,742,000	....	....	....	$26,130
Lead Hill Mining Company	18,000	40,000	184,000	50,000	5,164
Mignonette Mining Company	3,142,000	....	....	....	41,917
Pleasant Valley Mining Company	1,200,000	....	....	....	15,600
	6,102,000	40,000	184,000	50,000	$88,811
CENTRAL CITY.					
Rabbit's Foot Zinc Mining Company	2,320,000	....	....	....	$30,000
Short Creek Mining Company	290,000	....	55,000	16,000	4,521
	2,610,000	....	55,000	16,000	$34,521
PROSPERITY.					
Boston-Get There	4,183 000	....	784,000	....	$65,193
Mt. Ararat Mining Company	3,768,000	....	256,000	....	51,028
Plutocrat Mining Company	210,000	....	16,000	....	3,038
Roberta Mining Company	650,000	....	38,000	....	9,121
Ten O'Clock Mining Company	....	38,000	1,620,000	....	38,270
	8,707,000	38,000	2,714,000	....	$166,650

CARL JUNCTION.

Ishpeming Mining Company	4,264,000	....	324,000	....	$66,462
Oxford Mining Company	9,451,000	....	19,000	....	125,397
Venture Mining Company	1,554,000	....	12,000	....	20,466
	15,299,000	....	355,000	....	$212,325

CAVE SPRINGS.

Bunco Mining Company	808,000	....	222,000	....	$14,808
Ihlseng Mining Company	2,486,000	....	230,000	....	34,567
McMillan-Raymond	3,306,000	....	....	....	43,804
	6,600,000	....	452,000	....	$93,179

NECK CITY.

Eclipse L. & M. Company	178,000	....	136,000	....	$5,791
Mistletoe Mining Company	5,160,000	....	....	....	69,015
Old Colony Z. & S. Company	4,660,000	....	143,500	....	59,171
Spinx Mining Company	4,106,000	....	36,000	....	54,224
	14,104,000	....	315,500	....	$188,201

REEDS.

Neeley Mining Company	248,000	....	....	....	$3,189

TABLE II—Continued.

ZINCITE.

Name of Company.	Pounds of zinc ore.	Pounds of silicate.	Pounds of lead ore.	Pounds of dry-bone.	Value of all ores.
Bailey and Stickney	64,000		5,000		$1,059
Bellville Land and Mining Company	200,000				2,221
East Hollow Mining Company	838,000				10,053
Freeman Land and Mining Company	2,390,000				34,622
Hagardon R.	146,000		34,000		2,457
Holden Bros.	684,000		2,000		8,518
Lincoln Mining Company	5,320,000		200,000		71,116
Mallett & Freeman	656,000		42,000		8,807
Perkins Zinc Company	934,000				14,010
Springer & Page	698,000		16,000		9,180
Stuckey Mining Company	300,000		10,000		3,980
West Hollow Mining Company	396,000		60,000		6,415
	12,626,000		369,000		$172,438

NEWTON COUNTY.

This county is in the form of a parallelogram, containing 610 square miles, is bordered on the west by Kansas and the Indian Territory and on the north by Jasper county, the county line running within one-half mile of the city limits of Joplin. The early settlers supplied themselves with lead ore picked up in many places for the material with which to kill bears, deer, turkey and other game, but with no thought that the small pieces of lead found on the surface and in the creeks were the indices which pointed to the rich treasures buried beneath the surface. In the spring of 1847 Thomas Shepherd and Simpson Oldham went to work in earnest in the search for lead ore in the southwest of the southwest quarter of section 26, township 26, range 32, and soon found lead in considerable quantity; these diggings developed into the Mosely Mines, since made famous by its production. In the same year lead was found three miles distant, the work at both places being carried on until the war between the states. In 1871 work was resumed, a shaft sunk developed a good body of ore which was worked for some time.

The richest mines of the county, the discovery of which preceded that at Joplin, was at Granby in the year 1850, at which time the land could have been purchased for 50 cents per acre. No mining of any consequence was done at Granby until 1853 or 1854. The ore was hauled in wagons to Fort Smith, Arkansas, and then boated down the Arkansas and Mississippi rivers to New Orleans, and from there shipped to New York and Boston. Other shipments were made by hauling in wagons to Boonville, thence shipped by the Missouri river to St. Louis. In the meantime the Pacific Railroad Co. had acquired title to the land by a land grant. In 1857 Messrs. Blow and Kennett obtained a lease of the Granby section from the railroad and erected a large furnace. This stimulated mining to that extent that millions of pounds of ore was mined each year until 1861, when the war caused a suspension of work.

In 1865 the Granby Mining and Smelting Co. was organized, with the Hon. Henry T. Blow as its president, the interests of both Messrs. Blow and Kennett being merged in the company. This great company has been most fortunate and successful by reason of its splendid management; from its very inception its officers have been clear headed, conservative and yet progressive business men. Today this company owns 15,000 acres of land in this and other mining counties of the State, 9,000 of which is in Newton county. The product from its mines has for years averaged over $1,000,000 per annum, and since the organization of the company it has sold lead and zinc ores which in the aggregate exceeds $30,000,000.

This company has long been noted for its very kind treatment of its employes, miners and lessees, and perhaps nowhere in the United States have better terms or greater assistance been afforded the small operator than is experienced by operators on this property.

Mr. John Kingston, who clerked in a store owned by the original operators of the property in 1856, is and has been the superintendent of the Granby property in Newton County for years. Mr. Kingston's vast experience and thorough knowledge of the business makes his services to the company almost invaluable; then his fine business tact, kindness of heart and gentlemanly deportment has endeared him to all over whom he has had control.

The inspector, at the time of his last visit to Granby, had his attention called to an incident which shows how persistently certain families and their decendents have clung to the work in the smelter at that place. A short time previous a member of one of the families at Granby died, and so related by intermarriage were the employes in the smelter, that work had to be suspended at the smelter and mill to allow the numerous relatives to attend the funeral.

There is now in use at the mill the first set of rolls used in this State, and although these rolls were carried off to the country during the war and used by an old farmer as a sugar mill, they are yet in constant daily use, and to all appearances as good as ever. At this same mill there will be found in use the first Blake crusher shipped to Missouri, doing as good service as ever. The first pig of lead molded in Southwest Missouri may still be seen at this mill.

In an experience, such as Mr. Kingston, the superintendent, has had, very many peculiar and interesting incidents have attracted his attention. He tells of a shaft that had been worked independently by some miners, where the water becoming too strong for them they abandoned it; some ten years thereafter he determined to reopen the shaft, demonstrate the extent of the ore body and if it justified, to operate it. After the water had been pumped out, an old shoe was found, such as miners sometimes wear in the mines, having the sole and heel tacked on with a kind of hob nail with large head, and that on the head of each one of the nails a perfect cube of lead had formed, some of the nail heads had two cubes on them while one of them had three cubes on it. Another instance was related of a hog that had fallen into a shaft that was filled with water. We were shown a portion of the hide of this hog that had remained for fifteen years in the water; the bristles were in tact and the hide looked as if petrified. Capt. Kingston, however, informed us that we must call it "adipocere" and not a petrification. We, of course, consulted our encyclopedia to find out that adipocere—means, "soft, unctious, or waxy substance of a light brown color, into which the muscular fibres of dead animal bodies are converted, by a long immersion in water." Capt. Kingston picked up out of his splendid collection a piece of lead on which a perfect "K" had been formed, and said to us, I have been hoping that Dame Nature would send me a "J" to complete my monogram, but the nearest approach to it you will find on the end of this egg.

The smelter, mills, machine shop and boiler works have been so often referred to in former reports as to make another description unnecessary. The fact that there is an annual output of 5,000 tons of pig lead from its smelter, that it can manufacture boilers and do the repair work on every kind of machinery used in the mines, at home, shows the completeness of every department. The other plants and equipment on the company property embrace six concentration plants, 30 hand jig plants, 43 producing mines, 44 steam boilers, 40 steam pumps, 38 steam hoisters, 14 horse hoisters, 10 crushers, 33 steam and 30 hand jigs. The shafts range from 40 to 200 feet, with 319 miners and 65 other help employed.

The product from the Newton county mines of this company for 1901, is as follows:

Zinc ore, 14,918,400 pounds; of silicate, 11,754,400 pounds; of lead ore, 1,948,499 pounds, and of dry-bone, 95,293 pounds.

Among the large operators on the land are the Mascot Mining and Milling Co., with one shaft; the Wyoming Mining and Milling Co., two (2) shafts; the Blue Jacket Mining and Milling Co., one (1) shaft; Little Boss Mining Co., and the Morning Glory Mining and Milling Co., one (1) shaft.

The Mascot Mining and Milling Co. has a lease from the Granby Mining and Smelting Co. of 14 acres, with a capital of $8,000, invested in plant. The equipment consists of one concentrating plant, complete, one mine producing ore, two shafts having depths of 80 and 137 feet, respectively, two steam boilers, one steam pump, one steam hoister, four crushers and four steam jigs. There are 17 men employed, that are paid $1.60 per shift of 8 hours. The output of this mine shows 872,000 pounds of zinc ore and 17,300 pounds of lead ore.

The Blue Jacket Mining and Milling Co. has a lease of 21 lots from the Granby Mining and Smelting Co., with a capital of $30,000. The actual number of days worked in producing ore during 1901 was 77 days; prospect and development work occupying the most of the time. A complete concentrating plant was erected during the year and such buildings constructed as would provide protection for the same. During a part of the year one zinc and two silicate mines were worked; the zinc shaft is 105 feet and the silicate shafts average 80 feet in depth. There are two sub-lessees on the lease of the Blue Jacket: the Roosevelt Co., with one shaft, and Ferguson & Co., with one shaft. The output owing to the limited time the property has been producing ore is necessarily small, showing 257,000 pounds of zinc ore and 25,000 pounds of silicate.

Wyoming Mining and Milling Co., operate 21 lots on the Granby land in section 6, township 25, range 30. The capital invested in plant by this company amounts to $17,554.52. The equipment consists of one complete concentrating plant, two steam boilers, one steam pump, three steam hoisters, one crusher and three steam jigs. Two mines were operated during the year, with an output of 440,210 pounds of zinc ore and 96,880 pounds of silicate. The shafts are 82 and 81 feet deep respectively. Mr. H. R. Williams is general manager, with post-office address at Granby, Mo. There are a number of small operators on the property of the Granby Co. The liberal terms offered large and small operators is of such nature as should increase very largely the present number.

UNITED ZINC COMPANIES.

This company in August last purchased 160 acres of mineral land midway between Joplin and Granby and known as the "Diamond Land in Newton County." This land is directly on the line of the railroad being constructed by the Missouri Pacific Railway between the two places named. The land has been proven a mineral land by a shaft sunk in the center of the tract showing both lead and zinc values. With the completion of the railroad it is confidently expected that all this land can be leased to good miners and a very valuable mining camp opened upon it. This property was purchased and paid for from the surplus earnings of the United Zinc Companies, without increase of its capital stock, and makes the present holdings of the company owned outright as follows:

At Joplin, in Jasper County	120 acres
At Aurora, in Lawrence County	84 acres
At Diamond, in Newton County	160 acres
Total	364 acres

The inspector hopes that the good fortune which has followed this company, may continue with it, and that "Diamond" as a great mining camp may become noted throughout the country.

THE SULPHIDE CORPORATION.

This is a new company, with a capital of $70,000 invested in land and plant, with Mr. Frank Nicholson, as its president and general manager. The office of the company is in the McKinley Building, room 19, Joplin, Mo.

The land owned by this company embraces the 160 acres in the northwest quarter of section 17, township 26, range 32. The work so far has been confined altogether to development, four shafts having been sunk with depths reaching 52, 70.4, 80 and 106 feet respectively.

FOX RIVER LEAD AND ZINC COMPANY.

This company owns the lease on 40 acres of land located at Gregg, Mo., section 20, township 27, range 33. The capital invested in plant is $7,000. One mine was operated only a part of the year. Several shafts have been sunk to depths ranging from 40 to 80 feet. The equipment consists of one concentrating plant, steam boiler, steam pump, steam and horse hoisters, crusher and steam jig. The output from this mine was 546,000 pounds of zinc ore and 56,325 pounds of lead ore.

ALTA MINING COMPANY.

This company has a sublease on 20 acres of land belonging to Etta Owen. There is a first lease on this property, however, which embraces the north half of the northeast of the northeast quarter of section 14, township 26, range 33, and is controlled by Mr. Clark Craycroft of Joplin, Mo. Two mines were operated during the year, the shafts being 40 and 100 feet deep respectively. The output of the company shows 44,765 pounds of silicate, 6,080 pounds of lead ore, and 451,420 pounds of dry-bone mined. The equipment embraces so far two hand jigs and two horse hoisters.

SAGINAW LEAD AND ZINC COMPANY.

This company owns the fee to 780 acres of land located in sections 20, 29 and 30, township 27, range 32. The capital of the company is $50,000. Mr. J. W. Reinsmuller, superintendent, with post office address Saginaw, Newton county, Mo.

The company does a leasing business only. The output for 1901 was 6,790 pounds of silicate, 101,455 pounds of lead ore, and 19,460 pounds of dry-bone. The equipment embraces one concentrating plant, three hand jig plants, two boilers, one pump, one steam and three horse hoisters, two crushers, one steam and three hands jigs.

The Henrietta Mining Co. has a lease on 160 acres of this land and subleases to Long & Co., Rucker & Co., Bradford & Sons and Waugh & Co., each one of them operating a mine. The shafts range from 40 to 100 *feet in depth.*

ST. PAUL MINING COMPANY.

The St. Paul Mining Co. controls by lease and ownership 140 acres of land in section 10, township 26, range 33, on which there were two mines operated during the year. The shafts are 90 and 100 feet in depth. The equipment consists of one concentrating and one hand jig plant, three steam boilers, two steam pumps, two steam and one horse hoister, one crusher, one set steam jigs and two hand jigs. About 20 miners and 10 top men employed. The output amounted to 1,064,000 pounds of zinc ore, 386,000 pounds of silicate and 1,015,130 pounds of lead ore. The company has made leases to Eads & Co., McDonald & Co. and Taylor & Co., each one of the companies are so far engaged in prospecting only.

OLD SPURGEON, EASY STREET AND NOXALL MINING COMPANIES.

The property controlled under the above named concern, comprising 240 acres embraced in the north half of the southwest quarter, south half of the northwest quarter and the north half of the northwest quarter of section 31, township 26, range 32. The property is owned by H. E. Bucklin, 275 Michigan Ave., Chicago, Ills., and W. G. Wells of Neosho, Mo. The value of the plant and other improvements amounts to $60,000, and consists of the following: Three complete concentrating and four hand jig plants, eight steam boilers, five steam pumps, ten steam and seven horse hoisters, seven steam and eighteen hand jigs. The output has been very good from this property during the year, as there was mined 6,000,000 pounds of zinc ore, 49,000 pounds of silicate, 1,500,000 pounds of lead ore and 50,000 pounds of dry-bone, which sold for $100,245.

The owners of the property do no mining on their own account; but the property has been thrown open to miners under rules and regulations prescribed by the mining laws. Mr. Lewis J. Daegling, superintendent, is located at Spurgeon. The following companies have leases on this property: Hub Mining Co., Great Combination Mining Co., Wandering Jew Mining Co., Soldier Boy, Road to Ruin, Bushner Bros., and Himmel, Log Cabin and Cora Jeannette Mining Co.

The Cora Jeannette Mining Co. has a lease of 8 acres of this property and has made a good showing during the year from one mine. The production from this mine was 3,018,102 pounds of zinc ore, 4,390 pounds of silicate and 945,755 pounds of lead ore; the output sold for $54,241.86. A royalty of 20 per cent is paid on all ores mined. Improvements made by the company during the year consist of an air shaft, tramway, new elevator, hoister and derrick house. Mr. Edward Garland is superintendent with postoffice address Spurgeon.

NEMO MINING COMPANY.

The Nemo Mining Company owns the lease on 120 acres of land about 4 miles south of Joplin, 80 acres in section 35 and 40 acres in section 36, township 27, range 33. Mr. T. C. Mallery, manager, with postoffice at Joplin. Two mines on this property were operated during the year, producing 294,000 pounds of zinc ore, 50,000 pounds of silicate, 32,000 pounds of lead ore, and 10,000 pounds of dry-bone. The sub-lessees on the property are: Reding & Clark, operating No. 7 shaft; Hohenshell & Co, and Galloway & Co., prospecting. Two mines were operated and the shafts each about 100 feet in depth. Equipment consists of one steam boiler, one steam hoister, three horse hoisters and four hand jigs.

AUNT PATTY MINING COMPANY.

The Aunt Patty is not an incorporated company, the land under control is the 80 acres constituting the east half of the northwest quarter of section 19, township 27, range 33. H. H. Gregg, general manager, with postoffice at Joplin. The output from the four mines operated during the year, shows 100,000 pounds of zinc ore, 255,000 pound of lead ore, and 50,000 pounds of dry-bone mined. The shafts range in depth from 60 to 100 feet. The amount invested in plant is placed at $5,000 and consists of four hand jig plants, one boiler, one steam pump, three steam and two horse hoisters. Parties holding leases under this company are Wilkins & Co., White & Co., and Gibson & Co.

GERMAN-AMERICAN MINING COMPANY.

This is a partnership—DeGraff & Co. and J. Reinmuller & Co. The land controlled by this company is the north half of the southwest quarter of section 20, township 27, range 32, containing 80 acres. The work on this property during the year was prospect work only, there being three different parties engaged in development work.

GOBBLER MINING AND SMELTING COMPANY.

The Gobbler Mining and Smelting Co. was operated throughout the year by that company; but since January 1, 1902, it has been in possession of the Empire Zinc Co., it having purchased the property. The amount claimed to be invested in land and plant is placed at $200,000. There are 160 acres of land in this tract, being the east half of the northeast quarter of section 11, township 26, range 29.

But one mine was operated during the year and it produced 2,418,000 pounds of zinc ore and 838,000 pounds of silicate, which sold for $35,576.25. Improvements during the year consisted of the rebuilding of the mill, construction of a derrick, 600 feet of tramway, the placing of one new 150 horse power boiler, one 6-drill air compressor and one dynamo for lighting the mill. A number of shafts have been sunk on this property—eight, to depths ranging from 72 to 117 feet. The fact that the Empire Zinc Company has purchased this land makes it evident that the work on this valuable piece of property will be pushed.

LAUGHLIN & BROWN.

Laughlin & Brown are successors to the Digby Mill and Mining Co., having purchased the property with a view to reviving the work on this tract, which has been suspended for some eighteen months. A small output was made just before the close of the year.

KEYSTONE LEAD AND ZINC COMPANY.

The Keystone controls 40 acres of land located at Spring City. There are two shafts on the property 107 and 155 feet in depth. About two weeks of work only was performed during the year. Mr. F. C. McCowe is the general manager of the company.

THE KANSAS CITY MINING AND MILLING COMPANY.

The Kansas City Mining and Milling Company, composed of Rains Bros. & Carpenter, own 40 acres of land one mile south of Jackson Station on the Frisco R. R. The capital invested in land and plant is placed at $50,000. During the year two mines were operated, producing 2,154,000 pounds of zinc ore and 40,400 pounds of lead ore and 4,500 of dry-bone, which sold for $23,053. The equipment consists of one complete concentrating plant, two boilers, steam and horse hoisters, crusher, three steam and two hand jigs. White & Company have a lease on this property and operate one mine.

BOSTON-SPRINGFIELD ZINC COMPANY.

The Boston-Springfield Zinc Co. owns the northeast quarter of section 19, township 27, range 33, containing 160 acres, with a capital invested in land amounting to $8,000. In addition to the above land the company owns the fee to the 160 acres in the northeast quarter of section 32, township 27, range 33, on which no mining has as yet been done. This company does not mine on its own account, simply leasing the *land on a royalty*. Four mines were operated during the year and produced 3,016,000 pounds of zinc ore and 59,920 pounds of lead ore, which sold for $34,526. The plant and equipment consists of two complete mills, two hand jig plants, three steam boilers, steam pump, three steam and two horse hoisters. The companies holding leases on this tract are as follows: Monitor Lead and Zinc Co., Viola Mining and Milling Co., McDougal & Co., Thompson & Co.

The Monitor Lead and Zinc Mining Co. has a lease on 7 acres of this land, operated one mine and has two shafts of an average depth of 126 feet. There is a complete concentrating plant, two boilers, three steam pumps, and two steam hoisters on its lease. The output from this mine was 664,380 pounds of zinc ore and 2,920 pounds of lead ore. Beidebuer & Brown, P. O. box 711, Joplin, Mo., are the operators.

WILLIAMS LAND.

The land known as the Williams land embraces an acreage of 155 acres, section 23, township 27, range 33, its north line being the same as the southern limits of the city limits of Joplin. The tract is owned by Mr. L. F. Williams of Joplin, who does a leasing business exclusively. Mining on this property so far as production is concerned has really just commenced; judging from the long list of lease holders and the reputation of some of them as thoroughly practical mine men, much may be expected from the property. A number of mines were operated during the year with a production of 485,010 pounds of silicate and 1,045,505 pounds of lead ore, which sold for $27,199.00. The shafts average 60 feet in depth and seven hand jig plants, two steam hoisters and fourteen horse hoisters are used in cleaning and hoisting the ore. The lease holders on this land are: C. O. Frye, 6 shafts; B. Ott & Co., 2 shafts; Crowe & Pace, 2 shafts; Sycamore, 1 shaft; C. Busick & Co., 1 shaft; Handy & Co., 1 shaft; Alex Morris & Co., 1 shaft; R. D. Fallis & Son, 1 shaft; Uhles & Abrams, 1 shaft; Zook Hannum & Co., 1 shaft; Mich. Ames, 1 shaft; Newberger & Sutherland, 1 shaft; Sowerly, Compton & Co., 1 shaft; Warren Bros., 1 shaft; Durham & Evans, 1 shaft; Hottenstein, 1 shaft; and Lively & West, 1 shaft.

SHOAL CREEK MINING COMPANY.

This company has a lease on 40 acres of land five miles south of Joplin, on which it pays a royalty of 10 per cent. Four shafts were operated during the year at depths of 50, 60, 65 and 80 feet respectively. The zinc ore produced was of a chatty nature with a little too much mundic. The output for the year was small, but improvements have been added with the promise of a much better output for the current year. The equipment consists of two steam boilers, one steam pump, two steam and three horse hoisters, one crusher and six hand jigs. The parties operating on this land are: G. Isaacs, Frank Sowders, W. Howard, Jno. Isaacs, N. Ricketts, W. Sowders, Jas. Clark, Will Isaacs, Robt. Clark, E. Rickets.

SOUTH SHOAL CREEK MINING COMPANY.

Messrs. Reding & Clark compose this company and own the fee to 40 acres of land in the northwest quarter of the northwest of section 2, township 26, range 33. Two mines were operated during the year and produced a small amount of lead ore and dry-bone. A number of shafts ranging from 10 to 90 feet have been sunk. At present but two hand jigs and one horse power are in use.

LAWRENCE COUNTY.

UNITED ZINC COMPANIES.

This company owns the fee to 84¼ acres of land in this county formerly known as the Rinker land. This tract is situated just ¼ mile to the east of the city of Aurora. The capital invested in land and equipment amounts to $110,000. There are six complete concentrating and ten hand jig plants and eighteen producing mines on the property. The original purchase carried with it the land, one concentrating mill, mine and mining machinery.

There are five mills in operation on this property at present. Besides these there are two or three mills now in course of erection. All of the smaller mines have hand jigs for cleaning the silicate.

MILLS.

Name of Lessees.	Capacity per shift.
C. C. Plank	70 tons.
Dewey Mining Company	70 "
Big Bob Mining Company	100 "
Coleman & Scott	125 "
National	100 "
San Juan Mining Company, in course of construction	100 "
Galbreath & Company, in course of construction	100 "
	660 "

Of the above mentioned plants the company own but one, the National. This mill was built last winter on the National silicate mine. *It serves a double* purpose being used as a custom mill by many of the silicate producers on the company's land, as well as concentrating the ore at this immediate mine. The plant is new and fully equipped. In addition to this mill the company owns 4 pumps, leased to various lessees. The scale office is located near the center of the property, near the switch of the Frisco Railroad.

This property has been mined intermittently for the last fifteen years. The principal product until the past year has been lead and silicate. This has been found entirely in the west 40 of the land, while the blende opened up this last year has been mainly on the east end of the property. Four of the mills now operating are on the east end. Although the silicate mines have been operated for years, the output is still good with every indication of continuing. The blende mines have merely been opened, the development to present writing having been more than satisfactory. Development either in sinking shafts or in drilling has shown zinc to exist in large quantities on nearly every acre of the east 40.

Pumping is light in both the silicate and jack mines, and while as yet there has been enough water for washing purposes, the city water works have their mains on two sides of the property, and make a very cheap rate for mining plants.

The silicate ground is all open, a lime boulder formation with silicate found in flint and tallow clay pockets. The jack is found below from 20 to 50 feet of lime stone, making a first-class roof. The ore is a conglomerate, jack with lime and flint breaking free, however, in milling so that it is easy to make close saving.

C. C. Plank, the owner of the Buckeye mine and mill, has his mine very well developed; the main shaft is 105 feet deep, drifts running east and west, at the 90-foot level, for a distance of about 400 feet have left good ore exposed along the entire south side. Besides this a stope of 15 feet is available at once over the entire bottom of the drifts mentioned. The mine produces an average of 25 tons per week. The ore is high grade, 60 to 63 per cent metalic zinc, bringing the top prices of the Aurora camp. The mine rock yields from 8 per cent to 10 per cent concentrates. The mill is first-class, but small, having a daily capacity of about 70 tons mine rock.

The Dewey property, adjoining the Buckeye on the east, has a similar ore formation at the same level. As developed, their ore body is of about the same thickness, from 20 to 30 feet high. Drifts have located the north wall of the ore shute and cut along it for some 300 feet. On the south the ore dips becoming wider as ground is opend deeper. The mine rock yields from 12 per cent to 15 per cent concentrates; the blende from 60 to 62 per cent metallic zinc. The mill is small in capacity, but machinery first-class, handling about 60 to 75 tons of rock per shift of 10 hours.

The Expansion mines (mentioned above as the Coleman and Scott leases) seem to have a uniform blanket vein of ore from 15 to 20 feet thick, found at a depth of 70 feet. This has been opened from three shafts and in cutting in the last six months they have not yet found a dead wall. The mine rock yields about 12 per cent blende and the concentrates from 59 to 61 per cent metallic zinc with a little iron pyrites or "mundic" as it is generally known. The mill here is of 125-ton capacity, and is of the best equipment on the property. All the machinery is extra heavy and fully up to date in every particular.

The Big Bob property (D. R. Bradford & Co.) is new within the last 6 weeks. Their mine lies between the Expansion and Dewey. As opened the ore is found at about 70 feet from the surface with a face 25 feet high and 30 feet wide. The character of the ore is much the same as the Expansion, a little more lime in it, and considerable lead being found. Mine rock will yield about 8 per cent and concentrates from 58 to 60 per cent metallic zinc. The mill is of 100-ton capacity.

The San Juan Mining Company's property lies directly east of the Expansion and is a consolidation of the Big Six and Madry & Company leases. They seem to have found a continuation of the Expansion ore, having same formation and at nearly the same depth. A new mill is now being built on this property.

At several other points on the ground good prospects are being developed, practically every lease being worked. The increase in production during the past year has been very marked and present development points toward a still greater increase during the ensuing year. With the new mills in operation, and present prices of ore maintained for the year we estimate a tonnage of 7,500 tons of blende and 4,000 tons of silicate which will net the United Zinc Companies over $30,000.

The royalties charged on this property vary owing to various conditions.

The lease belonging to C. C. Plank is at 10 per cent, and runs for 10 years from the 22nd day of November, 1898. This low royalty was made as an inducement at that time to get a mill on the property.

The leases on the Dewey Mining Co.'s ground and that of the Coleman and Scott and D. R. Bradford & Co. are arranged on a sliding scale. When ore is $25 or under the royalty is 15 per cent; from $25 to $30 the schedule is as follows: $26, 16 per cent; $27, 17 per cent; $28, 18 per cent; $29, 19 per cent; $30 and above, 20 per cent. This concession was made in consideration of their building mills. This also holds good on leases issued at a higher royalty in case mills are built.

The lease of Minor & Rinker is another 10 per cent lease that was made before the United Zinc Companies took charge of this land. It runs for a period of 10 years from the 2nd day of June, 1899.

The remaining leases are at the rate of 20 per cent royalty.

These leases are not all made for the full term of 10 years, those on the silicate ground being made from year to year.

Of these leases, the twelve first on the list and the last, C. C. Plank, are mining, or prospecting for jack, while the remainder are working on silicate. The jack or blende requires milling to be handled at a profit, while the silicate mines, are, with the exception of the National, all hand jig plants.

	Names of Lessees or Mines.	Lots.
1.	Bradford & Co.	1, 8, 15.
2.	J. Coleman & Co.	2, 3, 9, 10.
3.	Loy & Wilson	4, 5, 11, 12.
4.	Dewey Mining Co.	6, 7, 13, 14, 21.
5.	D. R. Bradford & Co.	18, 22, 23, 24.
6.	A. Paul & Co.	16, 17.
7.	Coleman & Scott, No. 1	19, 20, 26, 27, 28.
8.	Coleman & Scott, No. 2	25, 32, 39, 40.
9.	Coleman & Scott, No. 3	41, 42, 43, 34, 35.
10.	Big Six Mining Co.	30, 31, 37, 38.
11.	Madry & Co.	29, 36.
12.	Breece & Co.	51, 59.
13.		44, 45, 52, 53, 60, 46, 61.
14.	K. P. Mining Co.	55, 47, & E. ½ of 56.
15.	The National	48, 49, 50, 57, 58, & W. ½ of 56.
16.	James & Dorson	65, 81.
17.	Armour & Whitehead	64.
18.	Galbreath & Co.	62, 66, 63, 54.
19.	Minor & Rinker	75, 76, 77, 78, 79, 80, 69, 72, 73.
20.	Ashens Bros.	71.
21.	Dearduff & Co.	74.
22.	Porter & Silman	67, 68.
23.		70.
24.	C. C. Plank	10 acres.

The production from the Lawrence county property since October, 1899, to December 31st, 1901, has been as follows:

Year.	Months.	Zinc.	Silicate.	Lead.	Value.
1899....	Ooctober, November and December.........	440,220	837,580	9,650	$17,780 17
1900....	January, February and March.................	815,610	779,310	2,270	17,929 69
	April, May and June...........................	541,160	625.930	12,120	12,843 48
	July, August and September...	749,760	1,010,070	30,880	17,249 44
	October, November and December...........	2,076,870	657,250	6,450	31,324 40
1901....	January, February and March................	3,615,690	1,242,270	5,480	51,704 53
	April, May and June	2,146,260	681,790	57,860	32,822 00
	July, August and September.......	1,244,550	1,007,370	52,720	21,068 20
	October, November, December 7th..........	566,990	733,020	33,225	13,802 20
		12,178,110	7,574,590	210,655	$216,524 11

STEWART LAND.

This land is located northeast of Aurora, and owned in fee by P. W. Stewart. The following lease holders are at work on the property:

The Methodist Mining Co. No. 1 has a lease 16 200-foot lots, the lease being owned by Reynolds & Beman, with J. W. Reynolds, superintendent. One mine was operated by this company during the year with a product of 199,000 pounds of silicate and 18,379 pounds of lead. The equipment consists of three hand jigs and one horse hoister.

The Baptist Mining Co., or Stacy & Co., has a lease of three lots 200x200 feet each on the Stewart land, with but one mine operated during the year, shaft being 100 feet in depth. The output was quite small, there being only 120,000 pounds of silicate mined. The equipment embraces one horse hoister and three jigs.

MT. VERNON MINING COMPANY.

The Mt. Vernon Mining Co. owns the fee to 237 acres of land near Stotts City. George O. McCoose, president, with postoffice address at Mt. Vernon, Mo. The capital invested in land and plant is given as $125,000. Four mines were operated during the year, showing a production of 2,030,000 pounds of zinc ore and 28,490 pounds of lead ore; the output sold for $26,815.00. The shafts range from 190 to 225 feet in depth. There are four concentrating plants on the land, six steam boilers, six steam pumps, six steam hoisters and five crushers. The lease holders on this property are as follows: Keystone Mining Co., T. S. Waddel, manager; C. C. C. Co., Henry Brumbeck, owner, leased by him to J. R. Haw and Horace Stotts; the "McFarlane," J. M. O'Grady, manager, leased to Bower & McGintly; the "Illini" sublet to Fuller & O'Grady. The "Small Hope" (prospect shaft), J. R. Woodfill of Aurora, manager.

"C. C. C. Mine," Henry Brumbeck, owner of the lease on 15 acres of this property, has $4,000 invested in a plant, consisting of one concentrating plant, steam boiler and pump, steam hoister, crusher and three steam jigs. One mine with shaft 200 feet in depth was operated during the year, producing 556,000 pounds of zinc ore and 2,160 pounds of lead ore, which sold for $6,862. The mine is now sub-leased to Haw & Stotts.

THE REIL-HUSTON MINING AND SMELTING COMPANY.

This is an incorporated company; Edward L. Reil, superintendent and treasurer, with postoffice address 712 Union Trust Building, St. Louis, Mo. This company owns the lease on 14 acres of land one and one-half miles northeast of Wentworth. Two mines with shafts 90 and 93 feet in depth were operated during the year, with a production of 120,000 pounds of zinc ore and 4,000 pounds of lead ore.

The company is sinking a new shaft and remodeling plant, which consists of one concentrating plant, boiler, two pumps, two steam hoisters, crusher and two steam jigs.

BOSTON-AURORA ZINC COMPANY.

This company purchased the 80 acres known as the Minor & Rogers tract and 458 acres formerly called the "Flournoy Tract," at the time undeveloped. The 80 acres was at one time an extraordinary producer. This company, represented by Mr. Frank Nicholson, has its office in Room 19, McKinley Building, Joplin, Mo. During the year the company operated one mine, (shaft 160 feet in depth) producing 1,565,280 pounds of zinc ore, which sold for $17,926.02.

The Myrtle J. Mining Co. have a lease of four lots from the company, from one mine, (shaft 245 feet deep) produced 1,277,200 pounds of zinc ore, which sold for $15,001.

The production from this property shows 2,842,480 pounds of zinc ore mined, which sold for $32,927.02. There are two complete mills, two steam boilers, two pumps, two steam hoisters, two crushers, and four (two lines in each mill) steam jigs on the property.

CHICAGO-AURORA ZINC AND LEAD MINING COMPANY.

This company owns a lease of 15 acres in the city of Aurora, on which there are six producing mines. The land is sub-leased to the Cuba Co., one shaft; Daugherty & Co., one shaft; Bell & Co., one shaft; Peirce City Mining Co., two shafts, and Florence Mine, one shaft. Shafts range from 112 to 180 feet in depth. The equipment embraces one concentrating and four hand jig plants, three boilers, three steam pumps, three steam hoisters, two horse hoisters, one crusher, and fifteen hand jigs. The product from the several mines on this lease was 1,800,000 pounds of silicate.

KENTUCKY MINING COMPANY.

The Kentucky Mining Company is incorporated under the laws of Missouri. I. Van Riper, Superintendent, with headquarters at Aurora. There are 20 acres embraced in this tract and is located about one mile east of Aurora. The production during the year shows 866,000 pounds of zinc ore, 254,000 pounds of silicate and 39,550 pounds of lead mined, by the following lessees: Toker & Co., two shafts; Ohio Zinc Co., two shafts; Chas. L. Boyd, three shafts, and Barber & Co., the latter working one shaft on the Boyd lease.

C. L. Boyd and E. W. Moore have a lease also on the Brinkerhoff land, their steam plants being located on that land. During the year four mines were operated, the shafts ranging from 40 to 147 feet in depth. The equipment consisting of four hand jig plants, four steam boilers, two pumps, four steam and three horse hoisters and one steam jig.

Boyd & Moore, as mentioned above, operate leases on both the Kentucky and Brinkeroff land, with Barbee & Wood and Kemper & Co. as sub-lessees. This concern has a complete concentrating plant with all needed machinery for the operation of their mines.

Chicago-Aurora Mining Co., E. W. Moore, Superintendent, has a lease of five acres of land, partly on the Kentucky Mining Co.'s property and partly on the Sphalerite land. Kemper & Co. hold a lease from the Chicago-Aurora, with an equipment valued at $11,000. During the year the mill on this lease has been completely overhauled, new shaft sunk, derrick erected, new machinery installed and much prospect work done.

A. L. WILFLEY LAND.

The owner of this land does no mining on his own account, simply leasing to such parties as wish to operate mines. During the year Seburn & Co. operated one mine, the shaft being 110 feet in depth; the equipment consists of a hand jig plant, boiler, pump and steam hoister. The output was of lead ore exclusively, there being mined 407,860 pounds.

TERRE HAUTE LAND AND MINING COMPANY.

This company owns the fee to 80 acres of land, which cost it $30,000. *Louis Duenweg* and others of Indiana comprise the company, with *Jacob Thielen* of Aurora as Superintendent. The equipment on this property consists of one complete concentrating and one hand jig plant, boiler, pump, steam hoist, crusher and set of steam roughers. The output during the year was derived from one mine, which was worked spasmodically, producing 32,220 pounds of zinc ore and 207,790 pounds of silicate. T. G. Wright and John Boxley each have a lease and are at work on the land.

SPHALERITE MINING COMPANY.

This company owns 7 acres of land formerly known as the "Nickel Plate." It is located about a mile east of Aurora, with a capital invested in land and plant amounting to $20,000. Mr. James R. Milner is president of the company. Two mines were operated only part of the year, owing to low prices offered for the ore, the mines were allowed to fill with water. The shafts average 110 feet in depth. 900,000 pounds of zinc ore and 3,000 pounds of lead ore was mined during the time operated. The Chicago-Aurora, S. Williams & Co., and H. Griffin & Co., have leases on this land. Since the close of the year, and better prices realized for the ore, prospecting has been commenced with an extra good outlook.

DECATUR LEAD AND ZINC COMPANY.

This is an incorporated company, controlling 40 acres of land just east of Aurora. Mr. Jacob Thielen of Aurora, Superintendent. W. E. Simpson operates one shaft, depth 131 feet; Jones & Co. one shaft, 130 feet deep, while Thomas & Co. are sinking a shaft having reached a depth of 75 feet. The output from this property for the year was 932,000 pounds of zinc ore, 2,276,000 pounds of silicate and 176,000 pounds of lead ore, which sold for $31,732.90.

Jones and Co., who have a lease on this property, are erecting a mill of 100 ton capacity. The equipment on this tract embraces a complete concentrating and jig plant, three boilers, two pumps, air compressor, three steam hoisters, crusher, set of steam jigs, and complete mill.

FEDERAL ZINC AND LEAD COMPANY.

The Federal Zinc and Lead Co. controls 20 acres of land, being a fractional part of the southwest of the northeast quarter of section 7, township 26, range 25. Two mines were operated during the year; but there are four shafts sunk with depts ranging from 40 to 65 feet. There are two complete concentrating plants on the land, together with three boilers, two pumps, three steam hoisters, two crushers and two sets of steam jigs.

The Jack Rabbit Mining Co. has a lease from the Federal Zinc and

Lead Co. The output for the year was 606,000 pounds of zinc ore and 83,290 pounds of lead ore. Mr. M. D. Boddy of Aurora is Superintendent.

LOUIS F. HYDE MINING COMPANY.

Mr. Louis F. Hyde of Boston, Mass., owns 13 acres of mineral land at Stotts City, Mo., which, together with plant, has cost $40,000. One mine was operated a part of the time during the year, producting 306,000 pounds of zinc ore and 37,420 pounds of lead ore.

CLEVELAND-AURORA MINERAL LAND COMPANY.

This company controls 169 acres of land at Aurora, is capitalized for $500,000, and is represented by Mr. C. H. Baldwin, with postoffie address at Springfield, Mo.

This company does a leasing business only, and in the reports made of sale of ore is frequently called Baldwin land by the sub-lessees. The equipment on this property consists of three concentrating plants, seven hand jig plants, ten boilers, five pumps, five steam hoisters, nine horse hoisters, three crushers, three steam and fifteen hand jigs.

There were fourteen shafts operated during the year, ranging from 40 to 172 feet in depth, with an output of 1,746,720 pounds of zinc ore, 1,512,130 pounds of silicate and 138,740 pounds of lead ore.

The lesees on this property are as follows:

C. & A. plant, H. L. Taylor & Co., 1 shaft.
Shot Gun lease, 1 shaft.
Baker & Co. lease, 1 shaft.
Oli Olsen lease, 1 shaft.
Freeman lease, 1 shaft.
Persimmon Tree lease, 1 shaft.
Umateller lease, 1 shaft.
Mayflower lease, 1 shaft.
Turkey Track lease, 1 shaft.
Red Rose lease, 1 shaft.
J. Bull Mining Co., 2 shafts.
South Bonanza Mining Co., 1 shaft.
Campbell & Co., 1 shaft.

SANDY HILL MINING COMPANY.

This company, with 120 acres of land, 40 of which is owned and located one and one-half miles east of Aurora, promises a good output for 1902. Only prospect work was done during the year and preperations made for future work.

Jasper, Newton and Lawrence are the principal ore-producing counties of Southwest Missouri, there are other counties in the district in which considerable mining has been done that will command more attention as development work progresses. Barry, Christian, Dade, Greene, McDonald, St. Clair and Taney counties each produce some mineral.

In Barry county, at Purdy and Pinoneer, mining in a small way has been carried on for some years. The Pioneer Mining and Milling Company at Pioneer and Marriat & Berry, near Purdy, each made a small output during the year and are making improvements with a view to an increased output.

Christian county had a small production from the Alma Mining Company, located two miles south of Ozark. The current year will doubtless find several new mines opened up and greater interest taken in the mining of its ore deposits.

Greene county has made great progress during the year and the result of the development work done must add to the importance of the county as an ore producer. The character of the work being performed and the facilities furnished to demonstrate the ore bodies and handle the mineral all point to a thorough and systematic development.

The Daisy Mining and Milling Company purchased the holdings of the Star Mine on the 14th of December last, and by the end of the same month had produced 60,000 pounds of zinc ore and 20,000 pounds of lead ore. The property embraces a lease of 85 acres of land five miles southeast of Springfield, on Pierson creek. The equipment consists of one concentrating and one hand jig plant, two boilers, two steam pumps and a steam hoister. One shaft having a depth of 60 feet was worked during the time mentioned.

The Duncan Mine is operated by P. O. Rainey and is located in the southeast corner of section 32, township 30, range 24. One mine operated having a shaft 120 feet in depth, equipped with steam boiler, steam hoister, crusher and three hand jigs. The output was 24,804 pounds of zinc ore, 186,322 pounds of silicate and 16,094 pounds of lead ore. The work during the year was almost entirely confined to development, with an outlook for the current year very encouraging.

The Shamokin and Ash Grove Mining and Development Company is incorporated and preparing to develop a large body of land southeast of Ash Grove.

The Ash Grove Land and Mining Company is controlled largely by Pennsylvanians. Mr. W. F. Davis of Ash Grove is the General Manager. We hope to receive a good report from this company for the current year's work. The company has several shafts down to the 100-foot level and a number of men at work opening up and developing the property. There are a number of shallow diggings in the county that turn out a large amount of ore. Both lead and zinc ores are mined.

In Dade, St. Clair, Taney and McDonald counties much surface work is engaged in, while in St. Clair county, we understand, large bodies of land have been purchased by strong concerns with every prospect of the rapid development of some extra good mineral land.

The Inspector would, if he had the opportunity or help, visit each county producing ore, but, under the circumstances, it is simply out of the question.

CENTRAL MISSOURI.

HICKORY COUNTY.

Hickory county, by reason of its lack of railroad and river shipping facilities, is comparatively unknown as a zinc and lead bearing section of our State. For many years, however, lead ore has been mined and hauled from its territory in large quantities. We visited this county last fall and by the help and assistance of Mr. G. W. Crudgington, President of the Cross Timbers Bank, was permitted to visit a number of the old mines and some of the new ones. The first one visited was one called the "Seed Tick Mine," one and one-half miles northwest of Cross Timbers, and located in section 17, township 38, range 21. Mining at this point, it was plainly to be seen, had been carried on in that ground-hog style so common formerly throughout all Central Missouri; yet 200,000 pounds of lead ore was extracted from this mine in this primitive manner. Two shafts, one 58 and the other 69 feet in depth, were sunk on this ground, but before drifting commenced from either shaft the parties engaged in the work had some difficulty and work there has been suspended ever since. We should not be surprised, from the looks of the ground and conditions generally, if this would turn out to be one of the circles, usually so productive and so frequently found in Central Missouri. The work here covered about an acre of ground and no depth was reached except in the two shafts beyond the 30-foot level. One piece of lead uncovered here within four feet of the surface weighed 1,500 pounds.

In section 18, township 38, range 22, a mine known as the Captain Daniels was worked years ago, from which 400,000 pounds of lead was mined, some of which was hauled to Boonville and shipped to St. Louis by river; but the greater portion of it was hauled to Linn Creek to the smelter owned and operated by Governor McClurg.

In northeast quarter, section 14, township 38, range 22, a shaft was sunk to a depth of 40 feet by Jeff. Younger in the pursuit of lead ore. He struck zinc ore and not knowing what it was threw it in the dump with the waste material.

In section 18, township 38, range 22, the old Brown diggings show from 20 to 30 shallow shafts in a very small space where evidently much lead was mined.

In section 22, township 38, range 22, a silver mine is reported to have been operated by old man Brookshire. Considerable money has been spent in the effort to discover the vein, but so far with no success.

In section 24, township 38, range 22, zinc ore may be seen in the creek bottom in the crevices between the rocks. Three drill holes were sunk here within a radius of 300 yards, and in each hole zinc ore was found; these drill holes were not deep, being 65, 75 and 90 feet respecttively, the water flowing from each continually and it is said that all three are different waters. This property borders the Pome de Terre river and we would not be surprised if some very fine mineral property was developed here.

In the neighborhood of Quincy several thousand acres of land were leased some years ago by Major Melton of Clinton, Mo., for oil companies it is reported. It is claimed that the indications point to it as an oil region. The land is in sections 28, 29, 30, 31, 32 and 33, township 38, range 23.

Capt. R. A. Vance of Cross Timbers owns the southwest quarter of section 9, township 38, range 20, on which lead and cannel coal have been developed.

At Pittsburg, in the southeast part of the county, we found a number of shafts sunk and a very large amount of zinc ore piled up ready for cleaning. There were no mills in operation at the time. One small mill was in process of erection and enough of material on hand to run it for some time. Much of the ore was of the pebble variety and a large quantity was the most thoroughly disseminated zinc ore that we have ever seen.

At the time of our visit, although there were some eight shafts sunk and an excellent showing of ore on top, yet not a shaft was in operation. We concluded that possibly the ore was in such small deposits that it did not pay to work it. Since then we learn that the work has been revived with very encouraging results. We hope the report is true.

At Weaubleau, in the southwest part of the county, a considerable amount of zinc ore has been mined. Taken altogether, the county shows as much surface indications as any county in the State and will, with transportation facilities, attract great attention as a mineral-bearing section.

BENTON COUNTY.

For more than fifty years mining has been carried on in this county, but until quite recently the same character of mining has been engaged in here that has prevailed throughout Central Missouri for so long a time, and we mean by that surface or very shallow work. At present, however, a vast change has taken place in the nature of the work done and the appliances used to develop and open up the ore bodies. Work is now performed in a practical and systematic manner, with the result that underneath the surface diggings, which have been worked over and abandoned for years, rich deposits of lead and zinc ores have been found.

At Raymond, a new station on the Warsaw Branch Railroad, some three or four miles south of Cole Camp, a thriving mining town has suddenly sprung into existence, where but a year ago there was neither a house or a mine. It is true, numerous little mounds of dirt could have been noticed surrounding this locality, reminding one more of the work of gophers than of miners. To-day one may witness at this point two mills, each of 100 tons capacity, and each equipped with the most modern and up-to-date machinery. Every facility is at hand for the extracting, hoisting and cleaning the ore. Drill holes, it is claimed, demonstrated the ore as deep as the 212-foot level.

Mr. Fred Hoover controls a lease on 85 acres of the land at this camp and has sub-leased much of the tract to different operators, chief among them being the Americus Zinc, Lead Mining and Milling Company. This company was officered as follows: W. R. McCormack, President; G. E. Dunbar, Vice-President; W. A. Latimer, Treasurer, and Geo. R. Raymond, Secretary and Superintendent. Since the close of the year, we understand there has been some change in the organization. Three of the above-named gentlemen are from Colorado, while Mr. Latimer is a Missourian.

Five shafts have been sunk on this lease of an average depth of 115 feet. The lead ore being found at the surface nearly and the zinc ore following. In the main shaft the ore has been worked at two levels, with drifts at each level running in fine faces of rich mineral ground. The material through which the main shaft was excavated is what may be termed soft ground, there being no solid formation from top to bottom; the same consisting of clay, shale and boulders. This shale has the appearance at times of the coal measure shales, but it changes color frequently. This shale is shot full of "pebble jack" and the operators claim it will yield 15 per cent. It was quite generally noticed by us that the richest deposits on this land were found in open ground with no evidence of a stratified formation. The roof was of necessity a difficult problem, the timbering being carried from the bottom of the drifts up in sets story after story as the material was excavated. The management, we understand, contemplates a change, making it open work like an open cut from the surface on down. Drill holes, it is claimed, indicate a continuous run of ore for 1,500 feet in the same character of ore-bearing ground.

The equipment at this mine consists of a 100-ton mill, supplied with steam jigs, rolls and crushers, 80 horse power boiler, two engines, 45 and 60-horse power respectively, steam hoist, wire cables, two centrifugal pumps for supplying water to the mill, which requires about 1,000 gallons per minute, reservoir with a capacity of 1,500,000 gallons, one settling pond with a capacity of 250,000 gallons and a spur track conveniently and suitably located for unloading fuel and loading mineral, connected with the Warsaw Branch Railroad.

This company has one problem connected with its ore that has long perplexed some Cole county operators. The zinc ore is closely associated with baryte, making the separation a very difficult one, owing to the weight of the baryta. Roasting the ore to separate it is resorted to, but a more economical and satisfactory process, it is claimed, has been found for the separation.

The output from this mine during the year was 400,000 pounds of zinc ore and 150,000 pounds of lead ore. Since writing the above we learn that the company now controls 80 acres of this land.

THE ROCKWELL MINE.

The Rockwell Mining Company has a lease from Mr. Hoover of six acres of land, on which two shafts have been sunk, one 80 and the other 159 feet deep. In the deeper shaft, at a 40-foot level, a dice lead was encountered in a formation very similar to that in the Americus mine. At 150 feet a cap rock was struck and under this cap rock the pebble jack was found. The 80-foot shaft is also in ore. This company has a modern 100-ton mill, furnished with crushers, rolls, screens, jigs, 60-horse power boiler, 60-horse power engine and a powerful pump with which it will force water from its reservoir to the mill. The shaft house is well constructed and equipped with a new steam hoist and the facilities for the rapid handling of the dirt. The shaft house and mill are connected by an overhead tramway, substantially built. The machinery at the mill is housed by a well constructed building.

Mr. Hoover secured a lease on some land three miles southeast of Raymond and named it "Rich Hill."

In a small space covering, not to exceed 12 acres, there were found three different companies at work, the Rich Hill No. 1, Rich Hill No. 2 and the Columbia Mining Company. We now learn that all are under one lease and one company, known as the Rich Hill Company, with Mr. Ed. Church as Superintendent. At one shaft the company was drifting at the depth of 36 feet in very good lead and zinc ores.

The United States Mining Company and the Union Minion Company are practically the same and at work near the Rich Hill property. This company has its shaft down 125 feet and concluded to sink 50 feet deeper. At 135 feet good ore was struck, but the water was giving some trouble on account of being short in pumping facilities. The Companies at work at Rich Hill are as follows:

The Rich Hill Mining Co., Ed. Church, Superintendent.

The Columbia Mining Co., S. Van Winkle, Superintendent.

The Union Mining Co., J. B. Ford, Superintendent.

The Melton No. 1 Mining Co., James Powers, Superintendent.

The Melton has been worked for a number of years, a large amount of lead and baryta having been mined and sold. Within the last two years work was revived here and considerable ore extracted, but some disagreement among the owners of the lease has prevented that development that would have otherwise resulted. The drifts at this mine are in good ore and doubtless the friction that has existed will be overcome and the work progress as it should with the push and energy characteristic of Mr. Mr. Geo. Kieffer of Cole Camp, who is one of the moving spirits in this enterprise. At one time a smelter was operated at this mine, and it is claimed that 600,000 pounds of lead ore was produced in Melton No. 1. The ore is found in large cave-like openings, some 35 feet from the surface. Water got strong and the mine was abandoned. Since then the present owners of the lease have put in a steam hoist, an 8-inch walking beam pump, jigs and other machinery, sunk a shaft to the 65-foot level and are prepared for work. Late work brought them to the wall rock on the east side, where a run of lead, mixed with the other dirt, shows a width of about 15 feet and a depth of 10 feet or more, as far as tested. It may possible go much deeper. An occasional pocket of zinc ore is developed in the mining. The work at present is confined to the upper levels, where a clay opening, 8 feet wide, carrying considerable ore, was encountered. This mine closely resembles the Circles so frequently met with in this section of the State and will likely prove a good producer when systematically worked as the present management gives promise to do. Mr. James Power, a man of considerable mining experience, has charge of the mine at present.

MORGAN COUNTY.

Lead ore has been mined and shipped from this county for many years. From the best information we can gather, the period covering its greatest production was between 1850 and 1870, during which time it is estimated that 2,000,000 pounds of ore was mined. Within the last two years development work has been more active, with an activity on the part of some parties to tie up large tracts of land under lease and option, with the hope of securing an unearned increment without spending anything for development work. Too much of this kind of mining is hurtful, as it deprives a county of the money and effort of those who would develop, but who are unwilling to develop and pay a second royalty for such privilege to the parties having nothing at risk or stake. The Granby Mining and Smelting Company owns mining property in the county, and we know of nothing that would prove more fortunate for the industry in this county than for that great company to begin development work on its land.

There are a number of companies organized that control property in the county whose stockholders come from Pennsylvania, Ohio, Indiana, Illinois, Kansas and other States.

Cohn & Redman control the 160 acres on which the Stucker mine is located, in section 25, township 44, range 19. At this mine we saw 10,000 pounds of as pure, clean-looking lead as we have ever seen anywhere. This was late in the fall, and find its production for the few months of development work to have been 36,000 pounds of lead ore and 20,000 pounds of zinc ore. Two shafts have been sunk, 75 and 112 feet deep, respectively. Zinc ore was being mined in the deeper shaft, while the lead ore was mined out of a fissure-like opening some five feet wide and at a depth of 50 feet; the lead being found against the hanging wall. The equipment consisted of a 10-horse power engine and boiler, one 7-inch lift pump and horse hoister.

Cohn & Redman also operate a mine called "Octavia Belle," located four miles west of Glenstead. Two shafts have been sunk, one 40 feet and the other 50 feet deep. The output of the mine for two months was 190,000 pounds of zinc ore and 10,000 pounds of lead ore, which sold for $2,760. The equipment consists of two boilers, one steam and one horse hoister, three hand jigs and one steam pump. Two additional shafts were being sunk at the end of the year.

There are many other development shafts, but as the operators saw fit to make no report and compelled us to secure their output from the railroad agents and smelters, we have no excuse to offer in not more fully reporting them.

There are many mines in the county which we feel confident have not been half worked or tested properly, one in particular, "The Buffalo." At this mine a furnace was at one time operated and very large quantities of ore mined, and the appearances point to the probability of still further large deposits at this place as yet undisturbed.

MONITEAU COUNTY.

Until the recent extraordinary development of rich ore bodies buried deep under a heavy limestone cap rock, mining was carried on of late years in a very limited way. From 1840 to 1873 considerable shallow mining was carried on in every township within the county. In section 17, township 43, range 15, one of the most productive and celebrated circles ever worked in Central Missouri was operated for several years. This circle at the surface has a diameter of about 100 feet, the diameter increasing with depth. The ore was found near the walls of the circle and was worked out with all the material with which it was associated—clay, broken rock, some calcite and baryta, from the surface down to a depth of 90 feet; the center or core of this circle did not carry much galena and was left standing in cone shape. The wall rock forming this circle was comparatively undisturbed, there being no dip in the strata forming it; but numerous fractures carrying considerable ore was frequently met with. The work here was commenced in 1841 and again opened in 1854. As much as 3,000,000 pounds of ore was extracted.

There are a number of coal deposits in the county, some of which show an immense thickness of coal and in nearly all of them lead and zinc is found. These pockets of coal, as they are called, contain both the cannel and bituminous varieties. In a cannel coal deposit we noticed seams of zinc that were running perpendicular, then again where the coal took a pitch the zinc followed the angle of the pitch.

For some years we have contended that neither the circles carrying lead or the coal pockets have been as thoroughly tested for zinc ores as they should be. At the Brady diggings, a few miles south of Clarksburg and southwest from California on the Moreau, we noticed a shaft going down in the wall rock and just outside of a circle that years ago had turned out a large quantity of lead. Upon inquiry, we learned that the intention was to sink the shaft 200 feet deep and then drift into the circle. *We suggested* that as the shaft at the time was down below the level of any work done in the circle, that perhaps the wise thing to do would be to drift from the point then reached by the shaft (some 87 feet). This was done, and since then we learn, through Mr. Roy F. Bane, president of the People's Bank of Tipton, who is interested in the mining company, that the drift run into a fine body of zinc ore. This development we consider very important and it should lead to a more thorough exploitation of the great number of circles in Central Missouri producing both lead and coal.

The first great strike made in the deeper mining in this county was in the mine located about three-fourths of a mile east of Fortuna. The company owning the property and operating it is composed of the following: Homer P. Sewall, Monroe Harmon, Senator Merriott, W. S. Capeller and W. F. Quigley.

Some five drill holes were sunk on this property within a radius of 350 feet. The first drilling showed up so well on the first drill hole that the work of sinking a shaft was commenced at once. The remaining four drill holes were sunk and all it is claimed made equally as good showing. After the shaft had passed through 80 feet of solid limestone the ore was struck near the 100-foot level and drifting commenced. As a lead proposition it was exceedingly fine. There was some zinc ore, but nothing like the quantity of lead, although with depth the zinc ore increased in quantity. The excitement incident to this fiind was very great. Mine operators and mining experts from every direction of the country visited this mine and, wtihout exception, every man of them was extravagant in his praise of the mine and its possibilities. Mr. Allen Hardy, a Southwest Missouri operator of large experience, purchased land that adjoined the Fortuna mine; in fact, his land line was uncomfortably and distressingly close to the shaft sunk and which had proven so rich. Mr. Hardy with the keen insight born of his mining experience began sinking a shaft as close to the developed mine as his property line would permit, with the result that he was spared not only the inconvenience, but the time and expense usually associated with shaft sinking, in the handling of a large volume of water, the other fellow was keeping away from him. When Mr. Hardy struck his ore and had reached the point where he too might have some water to contend with, he simply suspended work until his neighbor reached a still lower level and continued to keep the water from him. In the meantime some gentlemen from Webb City had looked over the situation, and they were men who had worked as miners, then operated mines and also sold mines; they made an arrangement with Mr. Hardy to sell his property. They persuaded Dr. Gundling to visit Fortuna and he was completely captivated. The doctor had several mines in Jasper county, having for partners some very wealthy Chicago gentlemen. The Doctor at once made a visit to Chicago and soon had his associates ready for a visit to Fortuna. Now Hardy had very little ore in his shaft, and if the Chicago gentlemen and their expert visited Fortuna there would not be much to see. The owners of the only mine opened and the one which had created such a stir had offered Dr. Gundling five acres of their land for a very large sum of money. It was evidently decided by the doctor and his associates that they would notify the Fortuna mine owners that they would visit the mine and have an expert examination made of it, as this is exactly what they did. An examination of this mine on the east side of its north and south drift was practically the same as an examination of the Hardy land, because the east side of the drift was Hardy property. When the Doctor and his associates arrived at the Fortuna mine everything was found in readiness for being lowered into the mine. In an operated mine the shots cause the tamping and other dirt to be so plastered against the walls of a drift that it is almost impossible to see the ore in the sides; the owners of the Fortuna mine had duly considered all this and had the sides of the drift washed down and the way that mine looked on that occasion was enough to turn the head of any mine man, we care not how old he may have been in the business. The drift at this time was about 20 feet high, 20 feet wide and about 80 feet long, running north and south along Hardy's west line, and no matter where or in what direction the light from the lamp was turned, the bright glitter of the lead twinkled with an envied beauty, if we describe it in accord with the feelings of a beholder who admired and yet had no interest in the mine. The expert from Chicago unrolled a package containing a number of small canvas sacks, he had a miner raise a ladder so the top of the drift could be reached and then instructed the miner to take his pick, commencing at the top, cut a small channel through rock, lead, zinc or whatever else was on the side, the expert gathering in his canvas bag every little chip that fell. This kind of test was repeated in several places on the sides and ends of the drift. After which it was carried to the surface, the material weighed and then washed out until only the mineral was left, then the mineral was weighed and an average of the tests made showed 26 per cent of all the material taken out to be lead and zinc. This was fine, but the Fortuna owners and Dr. Gundling's people could not agree on terms. Fortuna people wanted very much more for the five acres surrounding the mine than Hardy asked for 160 acres, and, had they not tested the Hardy land?

Not long after this Mr. Hardy visited Fortuna and gave it out that he had sold his 160 acres to the Gundling Mining Company for one hundrend and twenty-five thousand dollars.

FORTUNA MINING COMPANY.

The Fortuna mine is owned by Messrs. Sewall, Capeller, Quigley, Harmon and Merriott, which has already been somewhat described. After sinking a shaft and opening up a drift, developed as rich and as pure a body of lead and zinc ore as has been seen in this State. The equipment consists of two small boilers, two pumps, steam hoister and five hand jigs. The product for the balance of the year was 462,000 pounds of zinc ore and 1,096,000 pounds of lead ore.

Since then the Fortuna company sold 20 acres of its property to the Standard Lead and Smelting Co. for a very large sum of money. The Standard Lead and Smelting Co. at once commenced preparations for the erection of one of the most complete concentrating plants, and the equipment of the mine with every facility for rapidly handling and cleaning the ore. It also secured an additional 60 acres of mineral land on which the drills have been put to work in locating ore bodies and is engaged in sinking other shafts. When its development work is completed and its mill is kept busy at work a large production can be taken care of.

GUNDLING MINING COMPANY.

The Gundling Mining Company is largely owned by Chicago people, it owns 160 acres adjoining the Fortuna company, has two shafts sunk and a third one in process of sinking. The equipment consists of an up-to-date mill supplied with rolls, crusher and steam jigs, two boilers of 100-horse power each, powerful pumps and, in fact, every facility for economically handling a very large output. That this company has a fine body of ore is unquestioned and that the current year will show that this is one of our great producers is quite evident.

THE MOREAU MINING COMPANY.

This company was organized last November under the laws of West Virginia, with a capital stock of $100,000. Its officers are C. L. Kurtz, President; E. M. West, Vice-President, and G. M. Rose, Superintendent. The company controlls 314 acres of land where its shaft is located; this tract is located one and one-half miles east of Fortuna on the Moreau creek. It also has under lease and option 1,500 acres more. Some 3,000 feet of drilling has been done on this land. The plant embraces two 100-horse power Atlas boilers, one 65-horse power Atlas engine, one pair Neosho cross head 10-inch pumps, with a capacity of 1,000 gallons per minute, one Shellinback double hoister, together with a complete pump rig well housed, blacksmith shop and storage house.

This company is sinking a deep shaft and our latest information was that a drift was in good ore.

The companies operating and developing at present are the Fortuna Mining Co., Standard Lead and Smelting Co., Gundling Mining Co., Moreau Mining Co., Hot Springs Mining Co., New Jersey Mining Co., Shelby Mining Co., Blair Mining Co., Sharon Mining Co., Daugherty Mining Co., Hershey Mining Co. and the Merrill Mining Co.

The amount of drill work already done in this county and now being done is something very remarkable. We are indebted to Dr. W. B. Hunter of Fortuna, who keeps thoroughly posted, for the record on many drill holes, and to Mr. E. B. Capeller for the following as a sample:

Eighty-acre tract Merrill land about a quarter of a mile south of Fortuna, recently purchased by F. S. Ozier and E. B. Capeller. Five drill holes, three of which show good lead and zinc cuttings in limestone and flint. Hole No. 1 struck zinc at 85 feet, good run to 100 feet. No. 2 from 122 feet to 151 feet had a rich run of lead and zinc. No. 3 showed nothing until we reached 156 feet, at which depth rich zinc cuttings were encountered and continued to 200 feet; no lead shines at any point. The run of ore was in black flint and soft magnesian limestone—no mundic. This land will be developed by Ohio parties.

The 100-acre tract, half mile south of Fortuna on Moreau creek, owned by the same parties, two drill holes. No. 1 had a rich run of lead 24 to 30 feet; hard sandstone 34 to 48 feet; 53 to 60 feet zinc shines; 72 to 76 rich zinc; 107 to 152 good lead and zinc; 164 to 172 rich zinc.

No. 2 showed no prospect; had a few lead and zinc shines from 75 to 100 feet very sparingly in lime and flint, after which met with a sandstone, which held for a long distance.

The La Mine Mining Company is composed of Jefferson City and St. Louis parties, and as most of its work has been done in Moniteau county, mention is made of it here. This company is organized with a capital stock of $20,000, its principal business is that of controlling land by lease and option and developing the same by drilling. After ore has been demonstrated on a tract it is prepared to dispose of it to parties who desire to engage in mining. Mr. Geo. W. Tainter of Jefferson City is President and Mr. J. C. Tellman is Superintendent, with headquarters at the drill which his company owns and operates.

COLE COUNTY.

This county first and last has produced a very large amount of lead ore, much of it classed as surface diggings. The truth is, however, the numerous circles worked in this county, have produced most profitably for their operators a very large share of this output. Eight circles have been worked so far and in some instances as much as 3,000,000 pounds of lead ore has been extracted. In the vicinity of Hickory Hill and bordering the Little Tavern and Bois Brule creeks and their tributaries a large amount of ore has been mined from the surface and the circles in years past. At the present time mining and prospecting in this vicinity is more active with more ore being produced than in all other sections of the county combined.

BLUE JACK MINE.

The prospect work at the Blue Jack mine demonstrates a good body of zinc ore. Unfortunately its close contact with the baryta and the failure heretofore to separate the ore from it, has proven a drawback to its further progress; but processses are being developed that promise to overcome this difficulty; when this is done good results may be expected from this mine.

FARMER DIGGINGS.

The Farmer diggings, as it is called, is located about one and one-half miles east of Hickory Hill; it has been mined in a disultory way for some years, although producing considerable lead all the while. At present some Kansas City parties have control with the prospect of systematic work. We shall not be surprised to find this turn out a very productive circle under proper management.

In section 22, township 42, range 13, and known as the Wallace Scott place, about two miles south of Hickory Hill, considerable lead ore was produced on the bluffs bordering the Bois Brule creek. During the past year several shallow shafts have been sunk, in each of which lead and zinc has been found, the zinc ore predominating. Several drill holes, each 200 feet in depth, have proven the ore in good body, one of which showed lead and zinc from 43 to 60 feet, zinc ore from 76 to 105 feet and again from 147 to 186 feet, with a slight show of zinc at 203 feet. The three distinct runs of ore speak well for this tract. On this same tract quite a quantity of very fine baryta has been mined and sold.

INDEPENDENCE MINE.

This is the most productive and proven the most profitable mine worked in this county for many years. It is on the Little Tavern creek in section 34, township 42, range 13, and bordered in every direction by surface diggings, with three celebrated circles on its nothwest corner. This tract embraces 44.30 acres owned and operated by Mrs. J. W. Marsteller of Jefferson City, Mo. It was purchased last August, opened up and worked but a few months before the year closed, with only three men in the ground, yet it produced 100,000 pounds of lead ore and 160,000 pounds of baryta in that time. With the opening of the Colorado railroad, which is within a quarter of a mile, making a saving of 16 miles wagon haul, the work will be prosecuted systematically and with an increased force. The first development was made in an open cut, the lead in contact with the baryta being encountered at a depth of four feet from the surface; the cut shows a six-foot face of lead and baryta on all four sides and presents one of the most peculiar formations ever met with in this section of the State. Other tests on the property has developed lead deposits in the clay, which were very rich, as much as 8,000 pounds being mined by two men in a day's work, while below the clay deposits the baryta and lead was again encountered. Flattering offers have been made for this land, but a thorough prospect of lower levels have been determined upon.

At Elston the drill has penetrated such good bodies of zinc ore that a deep shaft will be sunk at once. This tract of land lies just one mile south of Elston, attention having been called to it by the amount of surface work done there years ago. The company controlling this land by lease is composed of Jefferson City parties and others living in the vicinity of Elston; they are men of ample means to carry through their enterprise and we shall be very much surprised if they do not strike a good paying body of ore.

The completion of the new railroad from St. Louis to Kansas City will work a wonderful development in this county. The coal deposits at Hickory Hill have been tested only as to the depth of the coal and this showed 90 feet; should the deposit prove up as the surface indications show it, then this must add greatly to the advantage and advantages of this county. In the event of the successful termination of the deep development work contemplated at and near Hickory Hill, the ores, with the extraordinary cheap fuel at hand, would so reduce the cost of haul on both ore and fuel as to justify the building of a modern smelter.

MILLER COUNTY.

This county, like the other Central Missouri counties, makes a wonderful showing of surface mineral. Circles have been found and worked here also; one in particular having attracted much attention on account of its having been reached through a conical chimney. This is known as the Conlogue mine. In addition to a large amount of lead mined in this circle a great number of shallow pits surrounding this circle furnished a quantity of surface ore.

At the present time mining in this county is confined to the following localities:

Mary's Home mine, Gageville, Capps Landing, Tuscumbia and Aurora Springs.

MARY'S HOME MINE.

At Mary's Home mines two shafts have been sunk, having depths of 84 and 136 feet. In both shafts a dice lead (called dice because the size of the lead and its shape), was found within a few feet from the surface and continued to the bottom; unfortunately not in sufficient quantity to pay. Occasionally a pink shale was encountered which carried the pebble jack in small quantity. In the 136 feet of depth there was no evidence or sign of stratification whatever, the material passed through having the appearance of a confused mass of chert carrying beautiful fossils, Burlington limestone and sandstone, boulders of small and extraordinary size, shales of various colors, some carrying lead, while others carried zinc, coal, iron pyrite, also a small amount of calcite and baryta. In sinking the 136-foot shaft not a particle of water was encountered, although there is water in the shaft today, caused by a drift driven out where the water was encountered. The impression prevails very generally by the operators, miners and others familiar with such formations as embrace our circles, that this is one of them on a large scale. The geological survey having given this mine considerable attention has arrived at the conclusion that it is a circle and the operators will govern themselves accordingly in the future work, for should they strike, the wall rock proper, they feel certain of a large deposit of ore.

GAGEVILLE MINES.

The Gageville Mining Company during the year has done considerable work in sinking a shaft and in drilling. Its greatest success was, however, in a shaft only 30 feet in depth, where a large amount of lead has been mined. Shallow shafts innumerable may be seen on this property, out of which many tons of lead was extracted years ago, the ore being found in the tallow clay and also between the blocks of magnesian limestones.

On an adjoining tract of land controlled and owned in part by Mr. Buster, a similar condition of things exist, hundreds of small shafts evidencing by their dump piles the presence of lead and the fact that it must have been a very productive field at one time. During the year the work was revived and considerable ore mined. We were shown one shaft on this tract that was 70 feet deep, and out of which considerable ore had been extracted. The shaft had followed a chimney all the way and it is hoped that it will be explored still farther and that its operator may find much ore to repay him.

CAMDEN COUNTY.

Not a great deal has been said or written about Camden county as a mineral field, but the simple fact that the first furnace built in Western Missouri was located in this county as far back as 1846, indicates that the presence of mineral in its vicinity warranted it. Then, again, the innumerable shallow shafts that one may see all over the county, is in further evidence of the presence of mineral, including lead, zinc, copper, iron and baryta.

Our State Geologist says concerning a portion of the county that "At the Wheeler mine, in section 32, township 37, range 16, west, there is an area of intense local disturbance. With this is associated an erupted dike or boss of pegmatite. Special interest attaches itself to this outcrop, as it is the only one of the post-Archean age found in the Missouri valley, with the exception of the Mesozoic eruptions of Arkansas. Further it is the only indications we have that igneous action or metamorphism accompanied the crustal movements of the Ozark uplift. The country rocks are principally magnesian limestones; with them are some sandstones; they are normally horizontal and undisturbed. Immediately above the pegmatite, however, they assume abnormal and rapidly varying dips. Similar conditions have nowhere been observed within the Ozark area, and, in themselves, they are sufficient to have distinguished this locality as one of somewhat intense, though local, disturbance."

It is at this Wheeler mine, now controlled by the Hon. Dorsey W. Shackleford, that we anticipate the development of a rare deposit of what is called complex ore; this ore is of peculiar appearance, of rather earthy luster and of a blue black color, the lead and zinc in it being so blended that no method for its separation up to the present time has been discovered. The percentage of lead and zinc runs very high and failure to separate the two ores up to this time, has delayed any attempt to mine the ore. New processes for the separation of ores are constantly being discovered and we now learn that a process which will solve the difficulties surrounding this complex ore has at last been discoved.

Camden county had still another furnace built some years later than the one mentioned. This furnace was located at Linn Creek, and was operated by Messrs. Draper & McClurg, and up to 1873, it had produced 1,895 pigs of lead.

In sections 28 and 33, township 39, range 18, a well defined fissure vein ranging from 30 to 40 inches in width has been traced for a mile or more on the surface and its depth exploited by shaft to a depth of 185 feet. How much deeper the ore in this fissure may run has yet to be determined, as there are no indications of its closing. Depths to the 480-foot level in a similar fissure in Franklin county has been reached without showing signs of closing up.

The Hon. Dorsey W. Shackleford, together with several Kansas City gentlemen, own and control several hundred acres of the land through which this fissure courses. The development of this property did not progress with the energy that Judge Shackleford desired to see put into the work, and he secured a lease from his company on a part of the land. He at once organized a company, which is known as

THE NIANGUA MINING COMPANY.

The Niangua Mining Company controls land on which the 174-foot shaft has been sunk and from which 80 tons of zinc carbonate has been mined and piled up near the entrance to the shaft. This carbonate is found in the vein matter of the fissure and has never been missing from the time it was struck. The carbonate has never run less than 8 inches in width and has been encountered in all tests made on the line of the fissure. The fissure vein runs N. 18 degrees E., with a dip to the east of about 85 degrees. The wall rocks enclosing this vein are magnesian limestone.

The original shaft on this vein was sunk vertically for the first 30 feet, or until the fissure was struck, after which it followed with the angle taken by the fissure. This crooked shaft, with the fact that the timbering in it was getting unsafe, together with the fear of some disintegration of the wall rock, caused a change in the plans of the company in the matter of further prospect work by shaft. A vertical shaft is now going down, it being started far enough away from the surface line of the fissure to enable the company to strike the fissure at the 150-foot level. After passing through the vein with the shaft and a still deeper level is required, in which to mine the ore, the vertical shaft will be continued and the vein developed through a drift.

No water has been encountered in the sinking, but by many it is thought that when the water level is reached, that instead of a zinc carbonate a pure blende will be found to have taken its place. The carbonate runs a high percentage and with the present prices paid for the mineral, this mine should be made to pay handsomely. The development work gives assurance of a great body of ore that can be economically mined.

WRIGHT COUNTY.

Mining in this county, and especially in the vicinity of Mansfield, the county seat, has been prosecuted for many years; the period of greatest activity appeared to have been about 1876; after that in 1891 and 1892.

The year just closed has demonstrated a renewal of activity in the same locality, but no great producing mines have been developed, all operators reporting indicate that they are still in the prospecting stage of development.

CLARA E. LANE.

Judge L. M. Lane, at present making his home in Oklahoma City, has been looking after the prospect work on his wife's property, containing 120 acres, located three miles southeast of Mansfield. In a shaft 45 feet in depth shines of lead and jack were encountered all the way down, the last five feet showing copper.

THE EQUITABLE MINING COMPANY.

This company owns 80 acres of land located 3 miles north of Lead Hill and places its investment in land and plant at $2,400. Mr. John C. Johnston of Newton, Kansas, is Secretary of the company. The work so far accomplished shows one shaft sunk to the depth of 50 feet at the close of the year. This company was organized for the purpose of developing and mining lead and zinc ores in Missouri, Arkansas and Kansas.

RED BIRD MINE.

This porperty is owned by Messrs. Conway, Johnston & Mears, with postoffice address at Mansfield, Mo. The 40 acres in this tract is in the southeast of the southwest quarter of section 6, township 28, range 15. The capital invested in land and plant is placed at $15,000. The improvements during the year consist of the erection of a 100-ton mill, the placing of a steam hoister and boiler. One mine was operated only for a short period before the close of the year, as the operations are new. The product was 300,000 pounds of zinc ore for the short time operated. The one shaft sunk has a depth of 60 feet.

BEATRICE MINING COMPANY.

This company is composed of Nebraska gentlemen, who have purchased 40 acres of land in the southeast of the southwest quarter of section 36, township 29, range 16. Mr. J. Gam is President and C. P. Fall, Secretary. The work done up to the close of the year embraced the sinking of a shaft 78 feet in depth, in the sinking of which ore was produced worth $250, which the company held at the end of the year.

OZARK COUNTY.

The Alice mine is located in this county on a 160-acre tract owned and operated by the Renfrow Zinc Oxide Company.

The ore mined is Smithsonite or a carbonate of zinc, being the result of a decomposition of sphalerite or sulphide of zinc. The mine is operated by first stripping off the surface covering which varies from one to fifteen feet in thickness. The body of ore at present developed covers an area of six acres demonstrated to a depth of 54 feet by shafts, with ore still in the bottom. The boundaries of this ore body has not as yet by development work so far prosecuted discovered its limits. The ore is found in wide fissure veins between limestone walls, which vary in width from fifteen to fifty feet. The ore occurs in a soft clay and is quite rich. The material when mined out of these open cuts is hauled to an archemedian screw washer, commonly called a log washer; this consists of an octagonal log twenty feet long, with cast iron flights bolted on in a spiral shape. The log is placed nearly horizontal, the elevation being six inches at the discharge end. The material is shoveled in at low end and the water turned in at the high end, so that the log in revolving brings the material in contact with the water with the result that the ore is discharged perfectly clean, yielding on an average 65 per cent clean carbonate.

The cost of mining and cleaning the ore is less than $1.00 per ton; the ore is then hauled by teams over a very good country road, good the year round, to the works of the company at West Plains, Mo., at which place the company has a modern zinc oxide plant now in operation, located on its own land near the Frisco railroad and connected with that road by a private switch owned by the Oxide Company.

The plant consists of 16 furnaces, having a capacity of 24 crude tons of ore per day. The ore supply is furnished entirely by the Alice mine, which has enough ore in sight to run the works a year; developments, however, indicate sufficient ore to run indefinitely. The ore is pure carbonate of zinc and contains no sulphides, making it a most desirable ore for the manufacture of zinc oxide. The ore assays from 36 to 38 per cent metallic zinc.

HOWELL COUNTY.

Considerable development work has been done in this county and several mining companies have been organized; but we have been unable to get a single report from any company that claimed to produce ore during the year. The open cut work which prevails in the county did not make a serious demand for the attention of the Inspector; hence it was that we have relied upon the companies to make an annual report as the law directs without a personal visit to that end.

REX ZINC & LEAD MINING COMPANY.

The President of this company, Mr. W. A. Atkinson, furnishes us with the following information:

"We were organized during the month of July, 1901, and since engaged in development work. We produced no ore which was sold in 1901, but during the month of January, 1902, we sold some silicate at $13.80 per ton. Our property is wonderfully rich in both jack and silicate, while the same may be said of other properties around us. The greatest trouble with our country is lack of capital to develop it."

The 155 acres owned by this company is located 17 miles southwest of West Plains. The capital stock of the company is $50,000, and its equipment consists of a hand-jig plant, silicate washer, three steam boilers, two pumps, one steam and one horse hoister. There are two shafts of an average depth of 98 feet, with excavation open for 40 feet.

G. & G. MINING COMPANY.

This company owns 120 acres of land, and is capitalized for $20,000, and has an equipment of one boiler, one pump and one horse hoister. No ore was produced during the year just closed, but the statement is furnished that 400 tons of silicate was mined and sold for $13.00 per ton in October, 1900.

Mr. Wm. F. Gordon, Manager, without further explanation, simply makes the statement, "Not in operation."

SOUTHEAST MISSOURI.

ST. FRANCOIS COUNTY.

This county for the year ending December 31st, 1901, shows an increased output compared with the fiscal year ending June 30, 1900, of 34 per cent. The lead ore production of the county for the year was 144,856,000 pounds as against 108,074,000 pounds for the year before; an increase of 36,782,000 pounds or 18,391 tons. The increase in the value of the ore for same time was $671,593. The value of the lead ore product for the year was $3,119,389, as against $2,447,796 for the former year.

The number of acres of mineral land owned by the several mining companies is given as 21,345 acres. This by no means covers the entire acreage owned by the different mining companies, but rather represents the proved mineral bearing ground as far as tested.

The six mining companies which were operated during the year are capitalized for a total of $7,900,000. The mines operated number 21 in all, with shafts averaging 345 feet in depth. There were 1,353 miners and 1,117 surface men employed or a total of 2,470 men with an average daily wage of $1.65.

The were in use during the year 6 concentrating plants, 89 boilers, 69 steam pumps, 22 air compressors, 26 steam hoisters, 59 crushers and 459 steam jigs.

The companies operating during the year are as follows:

St. Joseph Lead Company, Bonne Terre.
Doe Run Lead Company, Doe Run.
St. Louis Smelting & Refining Company, St. Francois.
Central Lead Company, Flat River.
Desloge Lead Company, Desloge.
Columbia Lead Company, Flat River.

For the current year several new companies with mines developed to the producing point may be expected to add to the county output; then again several of the old companies have sunk new shafts and in some instances very fine bodies of ore demonstrated. With increased production from such sources and the constantly increasing product from the older concerns, we may expect an output from this county exceeding 80,000 tons.

An important feature associated with the mines of this county and absent in too many mining districts of this country, is that continuity of the ore bodies peculiar to this county and the further fact that nearly all of the mining companies own immense tracts of mineral land. In some cases ages would be required to exhaust the ore and it is this that gives such a future, stability and permanence to the mining business in this county.

As a permanent investment or as a legacy to be handed down to your children, and your children's children, where could one find a company or business offering better inducements or a backing to the investments equal to that furnished by some of the St. Francois mining companies.

ST. LOUIS SMELTING & REFINING COMPANY.

The St. Louis Smelting & Refining Company, with postoffice address at Desloge, St. Francois county, for some reason is universally called the National. We make this explanation that the St. Francois county people may know the property referred to in this article.

The mines are located at a station on the Mississippi River and Bonne Terre Railroad, known as St. Francois, in St. Francois county, Missouri. The capital stock of the company is $1,000,000. It owns 1,250 acres of mineral land thoroughly prospected by the diamond drill, and its mill and plant generally is considered the finest of its kind in the world, comparatively new and has a capacity for an enormous business. This property was long known as the "Taylor Mine," and as Judge William R. Taylor of Farmington, was very active in promoting the mining interests of St. Francois county, a brief history leading up to the transfer may not be out of place. Mr. Taylor prospected and then sold to the Doe Run Lead Co. the property upon which the town of Doen Run now stands, after which he turned his attention to prospecting a large body of land which he owned on Flat River. After his discovery of the disseminated lead ore on his Flat River property he began the sinking of a shaft on it, and when the same reached 200 feet in depth and a fine body of ore had been encountered, the Flat River Lead Company was incorporated with a capital stock of $350,000. The directors of this company were Wm. R. Taylor, R. P. Taylor and John Dryden, and the officers chosen were Wm. R. Taylor, President and Treasurer, and John Dryden, Secretary and General Manager. Immediately following the incorporation of the company work on the shaft was resumed. A saw mill was put in operation and timber prepared for building purposes; fifty wood choppers were given employment; three large boilers, an air compressor and a 54-inch hoister were installed. Air furnaces for smelting the ore were erected, a pumping plant was put in at Flat River and a mile of 8-inch cast iron pipe laid in order to furnish the required quantity of water for the works; a concentrating plant of 100 tons capacity daily was constructed, houses were built for the use of the miners and other employes, and Taylor Place and Leadville were laid out and soon became flourishing towns. After having sunk the shaft to the required depth and installed the necessary machinery and plant, about 100 men were given employment. The mine was operated successfully for a time; a large amount of ore was extracted and the furnace turned out large quantities of pig lead which was sold at good prices. Water in the under-ground work was encountered, however, which was so strong that it could not be successfully handled with the pumps and facilities at hand; the drifts eventually filled with water, then the shaft, and the work was suspended. This water was overcome later on by drilling two 13-inch holes through the solid rock to the lowest point in the mine. In these drill holes there were placed two very large deep well pumps operated from the surface, which worked to perfection, draining the mine completely in eight days, a fete at that time unprecedented in that section, the quantity of water and time considered. At this time the price of lead was so low ($2.40 per hundred pounds) it was decided to close down. Soon after, however, the St. Louis Smelting & Refining Company was given an option on the property and after having tested it with diamond drills night and day for months, it purchased this splendid piece of property, together with 600 additional acres owned by Judge Taylor, which adjoins it. It was in this way and manner after an unusually thorough prospecting under the immediate supervision of R. R. Moor, the St. Louis Smelting and Refining Co., in 1897, purchased the land of the Flat River Lead Co., whose capital stock was owned almost entirely by Judge Wm. R. Taylor.

In June, 1898, the new company secured the services of Mr. R. D. O. Johnson, at the time Superintendent of the Central Lead Co., and directed him to proceed towards developing the ore body and equipping the property with a large concentrating mill. It is to Mr. R. D. O Johnson that the Bureau is indebted for the following description of one of the most complete and finest plants of its kind to be found in any country:

The old "Taylor shaft," operated by the Flat River Lead Co., was small, inconveniently located and filled with water, so it was determined to sink a naw shaft. This was accordingly done, and Shaft No. 2 was started August 28th, 1898. This shaft was completed to a depth of 407 feet in eight months against a flow of 450 gallons of water per minute.

The shaft is 6x18 feet, giving space for two cage-ways, one pipe compartment and a ladder way.

Shaft No. 3, of similar dimensions, located on the northern ore body about 2,400 feet N. NE. of Shaft No. 2, was completed about a year later. This shaft was sunk to a depth of 395 feet and encountered but small amounts of water.

The plant completed in July, 1901, is the largest, most modern and complete of any in the lead district of Missouri. Mr. Johnson determined to adopt electrical distribution of power to distant points from one central power plant located at the mill.

The Central steam plant consists of two batteries of Babcock & Wilcox boilers of 600 H. P. each, fitted with large tanks for treating, chemically, the feed water. Coal is brought to the boilers on an elevated switch, and is dumped within a few feet of the fire doors.

The engine room located between the boiler house and contains the main engine of 850 H. P., belted direct to the main shaft of the mill, and driving by direct connection one 250 K. W. general electric generator.

Besides the main engine there is one 350 H. P. auxiliary engine directly connected to one 250 K. W. general electric generator and the two large air compressors. All the engines are of the cross compound Corliss type, operating under a steam pressure of 125 pounds and a vacum of 26 inches.

The compressors are of the two-stage compression type, with a capacity of 2,000 cubic feet of free air per minute, and delivering the air at 100 pounds pressure.

The mill is patterned largely after the copper mills of Northern Michigan, adapted to the local conditions, and to the requirements of the finely disseminated lead ore of this region.

The mill is divided into four sections, each driven independently through a clutch pulley from the main shaft. Any section may be shut down without in any way interfering with the working of the other sections. Each section has a capacity of 300 tons and holds two pairs of 36x15 Gate's rolls and one pair of 26x12 Gate's rolls for middling crushing, four trommels, forty-four iron jigs, six slime tables and two Hallett tables. The jigs are of special design, two compartment.

The ore is hoisted to the surface by electric hoists at the rate of 900 feet per minute in iron cars holding one ton each. The cars are dumped in grizzly bars, the smaller pieces falling to the bin below. The larger pieces are fed to seven 8-inch by 16-inch crushers of the *Krom type.* These crushers are belted to a jack shaft driven by a 100-*H. P. general* electric motor. The crushed ore falls into the same bin with the ore falling through the grizzly. From this bin the ore is withdrawn by a Robin's belt conveyor, and is dumped onto the main conveyor running over the bins in the mill. The main conveyor runs under the large track storage bin, receiving ore delivered in bottom dump cars from Shaft No. 3. By means of a movable tripper the ore is delivered to the mill bins, of which there are four, one to each section. The ore is fed from these bins by belt feeders to the 36x15 crushing rolls.

The "chats" or waste material of the mill is delivered into a tank 11 feet high by eight feet wide and 210 feet long. This large tank stands under the mill and delivers the chats directly into "A" dump cars. It required the removal of over 9,000 cubic yards of rock to excavate for this tank and for the railroad approaching it. This rock was used for making the dams for the settling ponds where 6,000 gallons of water per minute are freed from the mud taken up in the process of concentration. The water, after having been settled, is returned to the mill by two large Worthington triplex pumps, each throwing 2,000 gallons per minute. These pumps are driven through bevel gearing by rope drive from an extension of the main shaft of the mill. A pump of 1,000 gallons per minute capacity, driven by a 50-H. P. motor, is located at the river three-fourths mile distant, and serves to keep up wastage and to fill ponds drained for cleaning.

The company has about three miles of trolley line running to Shaft No. 3 and connecting with the M. R. & B. T. R. R. The track is laid with oak ties and 42-pound rails. Double trolley wires are used as a precaution against grounding motors necessarily placed in wet places. The 20-ton locomotive is equipped with double trolleys and air brakes.

As a very important auxiliary to the electrical equipment, there is provided a storage battery of 250 cells of the 15-plate type. This serves as an accumulator discharging into the main circuits upon sudden demand, as in railroad hoisting work, and absorbing the excess of power when the demand is light. By the aid of the battery an absolutely uniform voltage is maintained on the buss bars with great fluctuations of load.

Shaft No. 2 is equipped with one triple expansion and one compound, outside packed, plunger pump of 1,000 gallons per minute capacity each, made by the Fred M. Prescott Co., of Milwaukee. No. 2 and No. 3 shafts operate thirty 2 3-4-inch Rand drills.

The company has the best equipped machine shop in the district.

The plant as a whole is one of the best examples of modern, up-to-date engineering, and needs no better commendation, than is to be found *in the statement that it* requires but one and one-half carloads of coal *to operate it under full duty.*

The purchase of this property by so strong a company and the erection of such an extraordinary plant, has proven the entering wedge which has opened up the importance of this great district to that extent that foreign capital has poured into this district as it has nowhere else in the State.

From the two shafts sunk by this company and operated last year, one of which is 397 feet and the other 407 feet deep, there has been taken out 19,672,000 pounds of lead ore worth $448,521.50. The current year will doubtless largely increase the production over 1901.

ELIZABETH LEAD COMPANY.

The Elizabeth Lead Co. owns 373 acres of land near Bonne Terre, with $60,000 invested in land and plant. Mr. H. O. Wheeler is President, with office in the Chemical building, St. Louis, Mo. The company has 12 men employed in prospect work only.

DERBY LEAD COMPANY.

The Derby Lead Company, Federal Lead Company and the Irondale Company are all three under the same management. Owing to the fact that all work done during the year was confined to development work, the details concerning capitalization, acreage, etc., have not been furnished. It is currently reported and with good reason, we think, that the company controlling these properties own some 15,000 acres or more of mineral land in St. Francois and Washington counties.

The Derby Lead Company has two shafts sunk at a place called Elvins, which is almost a continuation of the town of Flat River toward the south. The two shafts are the deepest in the district, and we understand in one shaft at least a good body of ore has been struck; the shafts are over 500 feet in depth.

FEDERAL LEAD COMPANY.

The Federal Lead Company, in addition to what has been said of it with reference to its operations, has a shaft sunk and a mill erected on its property near Flat River. The very substantial mill constructed by this company and the fact that this concern has introduced many radical departures from Southeast Missouri methods, made us the more anxious to write up a description of the plant; but upon each visit we were requested to wait completion and the demonstration by actual operation. The reason assigned for not wishing a description of the mill made public, was a natural one and until a full experiment is made will defer our report on the mill.

The Irondale Company is in Washington county, and will be referred to in its proper place.

The owners of this property have seen proper to report the same under the head of the three companies named and until the mines are in working order and producing, we are inclined to avoid speculation as to who the owners are.

THE UNION LEAD COMPANY.

This company is composed of St. Louis gentlemen, with office at 509, Security building, St. Louis, Mo. The property controlled consists of 550 acres 2 miles southeast of Flat River and formerly known as the Donnelly Mining Company. The present management has done very little with the property so far; but we are informed that prospecting will be engaged in during the current year.

COLUMBIA LEAD COMPANY.

This company owns 943.89 acres of land near Flat River, adjoining the land belonging to the Central Lead Co. It is capitalized for $900,000. The principal stockholders are member of the American Metal Co. of New York and H. J. Cantwell, of St. Louis, Mo. The officers of the company are H. J. Cantwell, President; A. L. Tuttle, Manager, and C. M. Loeb, Treasurer. The mine was not operated until January, 1900, at which time its mill was completed and made ready for operations. The shaft is 6x18 feet in the clear, three compartments and sunk to a depth of 305 feet. The mill has a capacity of 250 tons daily, constructed along the most modern and approved plans, with all machinery and appliances of the latest pattern. An additional shaft has been sunk to the 500-foot level, and during the year two mines were operated, producing 11,850,566 pounds of lead ore, which sold for $206,584.90.

The mines are connected by a switch with the Mississippi River and Bonne Terre Railroad. The company for each 24 hours furnishes employment to 175.

DESLOGE CONSOLIDATED LEAD COMPANY.

This company owns 3,640 acres of land at the town of Desloge, on the Mississippi River and Bonne Terre Railroad, four miles south of Bonne Terre. The company is capitalized at $1,000,000; operates two mines, which produced during the year 14,994,000 pounds of lead ore, valued at $300,000. The shafts are 300 and 350 feet in depth, and during the year an additional shaft was partly sunk. Other improvements were added during the year, consisting of two additional calciners, blast furnace and a number of houses for the use of employes. The equipment consists of a first-class concentrating plant, ten boilers, five steam pumps, exclusive of boiler feeds, three air compressors, three steam hoisters, seven crushers and sixty steam jigs. Employment is furnished for 172 men daily at the mines and ten men prospecting.

The town of Desloge is built on land owned by the company, as it will not sell the land for any purpose; leases are made, however, with certain restrictions regarding saloons, etc., which the company deems necessary for its protection and the peace and comfort of the community generally.

The output of this company for the past seven and one-half fiscal years and the calendar year ending December 31st, 1901, is as follows:

ST. FRANCOIS COUNTY.

	Pounds.
For the fiscal year ending June 30, 1894	4,500,000
For the fiscal year ending June 30, 1895	8,400,000
For the fiscal year ending June 30, 1896	9,300,000
For the fiscal year ending June 30, 1897	10,400,000
For the fiscal year ending June 30, 1898	18,654,000
For the fiscal year ending June 30, 1899	20,088,000
For the fiscal year ending June 30, 1900	21,076,000
For the six months ending December 31, 1900	8,782,700
For the year ending December 31, 1901	14,994,000
Total	116,194,700

Mining on this property commenced in 1801 by what was known as the Mine a Joe or Bogy Mine; but this was in the surface ore and long before the great body of disseminated lead ore was known to exist. Prospecting by former operators was engaged in, but not until the Desloge company took charge was the deep run of ore discovered. It is claimed by some writers that the surface ores are not always present where deeper runs are found. With our experience, however, and from what we can learn concerning lead and zinc and also the precious minerals, we would prefer the surface indications.

CENTRAL LEAD COMPANY.

The Central Lead Company owning 1,604 acres in that very productive section of the county at Flat River, has been in operation since 1892. In May of the year named its shaft had reached the 242-foot level and encountered a body of ore on which it did some drifting; the prospecting, however, disclosed a much richer body at the 360-foot level.

The shaft was sunk to the 380-foot level during the summer of 1893, and in October the erection of the hoisting shaft was commenced and the same completed in May, 1894. The hoisting plant and concentrating works were at the time models of their kind. At that date the prospect work had demonstrated an ore body 3,000 feet long, 200 feet wide and 23 feet thick. The Inspector has since traversed one drift in this mine 3,000 feet long, at the face of which he found the air excellent, considering its great length; the length of the drift, however, with but one way of escape, was a matter of deep concern until the second shaft (the Rogers) was completed and a connection made with the drift. Mining at this point was carried on nearly 60 years ago in a primitive way, galena being found in considerable quantity, the fact of the disseminated ore being found at Bonne Terre induced prospecting with the diamond drill which encountered the ore above mentioned at the 240-foot level; this was in 1876, and it was not until 1892 that work was commenced in earnest.

The company produced during the year 18,441,355 pounds of lead ore, which sold for $414,930.49. Employment is furnished in the mines, mill and prospect work for nealy 300 men. There are three mines on the property with shafts having depth of 350, 355 and 380 feet, respectively. The plant has been referred to already, but in addition there are 15 steam boilers, 5 steam pumps, 4 air compressors, 3 steam hoisters, 8 crushers and 38 steam jigs.

The capital stock of the company is $1,000,000; its main office is at 420 Roe building, St. Louis, Mo. Mr. Arthur Thacher, President of the company, is to begin with a mining engineer of recognized ability, and his long experience in mining operations makes him an authority in all things connected with the industry.

DOE RUN LEAD COMPANY.

This company owns 4,000 acres of valuable mineral land in the county, is capitalized for $1,500,000 and does a very large business. This company is largely controlled by the officers and stockholders of the St. Joseph Lead Company. The concentrating plant of this company is at the town of Doe Run, which is located at the present terminus of the Mississippi River and Bonne Terre Railroad. The equipment of the company is a perfect one and embraces at its reduction works and at its mines 7 blake crushers, 41 steam jigs and 18 double tables, 20 steam boilers at the mines and 7 at the mill, 7 steam pumps at the mines and 10 at the mill, 3 large compound air compressors and 7 hoisters. Employment is furnished at its mill and mines for 668 men, distributed as follows: At the mines, 302 miners and 119 surface men; at the mill and furnaces at Doe Run, 247 men. The men in the mines acting as shovelers receive $1.70 per day; miners proper, $1.60; the surface and mill men from $1.25 to $1.55 per day.

Strikes with this company are rare occurrences; however, on the 20th of June, 1901, the men struck for 8 hours work, about half of them preferring 10 hours work with 10 hours pay. The company accepted 8 hours as the lawful day's work and granted the men the same pay they had been receiving for 10 hours work.

Three mines with shafts ranging in depth from 425 to 440 feet were operated during the year, producing 33,064,390 pounds of lead ore valued at $804,961. The average production for the past 14 1-2 years has been 16,282,288 pounds of lead ore per year.

The following table will show the production for the 14 1-2 years:

	Pounds.
For the fiscal year ending June 30, 1888	5,800,000
For the fiscal year ending June 30, 1889	10,487,000
For the fiscal year ending June 30, 1890	11,032,400
For the fiscal year ending June 30, 1891	8,437,900
For the fiscal year ending June 30, 1892	6,696,200
For the fiscal year ending June 30, 1893	7,186,600
For the fiscal year ending June 30, 1894	9,018,540
For the fiscal year ending June 30, 1895	11,400,000
For the fiscal year ending June 30, 1896	20,684,000
For the fiscal year ending June 30, 1897	25,264,400
For the fiscal year ending June 30, 1898	24,800,000
For the fiscal year ending June 30, 1899	24,580,000
For the fiscal year ending June 30, 1900	23,860,000
June 30 to December 31, 1900	14,290,000
For the calendar year ending December 31, 1901	33,064,000
Total	236,601,040

Mr. F. P. Graves, Assistant Superintendent and Secretary, has charge of and supervision over the mill and mines and a more competent man for the position will not be found in the State.

ST. JOSEPH LEAD COMPANY.

This company can lay claim as the pioneer in the development of the great disseminated lead field of Southeast Missouri. Having acquired originally by purchase the property known formerly as the "La Grave Mines," the company organized under the laws of the State of New York in 1864. For some years the company worked the surface ores in the primitive way common to that section and owing to the as yet unsettled condition of that section, growing out of the war between the States, no serious attempt was made in the way of improvement or development work. Old methods proving so unsatisfactory in the year 1869, the company purchased the first diamond drill brought to the State. Work was commenced with the drill with the discouraging results at first to be expected from its use by new men in a new field. The drill, after a few months' work finally reached the disseminated lead ore body, which was destined to not only make the St. Joseph-Lead Co. rich and famous, but furnish Missouri its claim to the richest and largest lead ore bodies as yet discovered in any country. Since then this company, with one exception, when the fire of 1883 destroyed its concentrating plant entailing a loss of several hundred thousand dollars, it has known nothing but progress and success, until today it is without a rival of its kind anywhere in this broad land. It has been and is still the greatest lead producer of any one company operating on one continuous tract of land. Its production during the year amounted to 46,834,850 pounds of lead ore, as this same ore is treated in its own smelter located at Herculaneum, the value of the pig lead resulting from its own production of lead, must reach not less than $1,300,000 in value.

The original land purchased by the company embraced that territory now covered by the beautiful little city of Bonne Terre, with its nearly 6,000 inhabitants. The land upon which this city is built is still the property of the company. The officers and stockholders of the company take a commendable pride in Bonne Terre, and they are responsible for its excellent schools and school houses, to say nothing of many other advantages enjoyed by its citizens.

At Bonne Terre the immense plant is erected for the treatment of the ore from its nine mines, located at Bonne Terre, Gumbo, Flat River and Owl Creek. The Mississippi River & Bonne Terre Railroad operating between Riverside, on the Mississippi river and Doe Run is 50 miles long, of standard guage, employing more engines for the same number of miles and earning more money per mile than any other railroad in the State, is the property of the St. Joseph Lead Co.

Many thousand acres of land have been acquired by this company, 10,000 of which is classed as mineral land. That the land so classed is mineral land the inspector does not doubt, as he himself assisted in the drilling of much of it, while he personally knows of the constant, persistent drilling on the company's property for many years.

With a capital issued of only $2,500,000, it is apparent from the holdings of this company that the above sum is very modest. The many thousand acres of land owned outright, on which nine (9) mines are operated, its immense plants for milling and smelting the ore, and its 50 miles of standard guage railroad thoroughly equipped with rolling stock, represent a value which under different management would be capitalized for a much larger sum than given above.

The company has been characterized all through its existence by a wise, prudent and conservative management. To Mr. C. B. Parsons, superintendent, and Mr. Gustave Setz, assistant superintendent, credit is due for the excellent conditions prevailing in and about the mines, and for the conduct of the affairs of the company generally.

MADISON COUNTY.

This county, in view of the fact that mining has been engaged in within its borders since 1720, has shown a lack of enterprise and progress difficult to understand. Mining for lead ore in what is called shallow diggings was carried on in that disultory way so commonly met with in this State where the ore is found near the surface, from 1720 to 1878, at which time the disseminated ore was uncovered at the 100-foot level. From 1878 to within the past two years no systematic attempt appears to have been made to locate the disseminated ore bodies of the county if we except the Mine La Motte property. Here, however, the property has been owned for years past, first by Mr. Rowland Hazzard and since then by Mr. S. H. Leathe, both being old men. The large body of land with its diversified interests, of a mining and smelting plant, with supply store doing a good business, drug store, postoffice, churches, school houses, many buildings furnishing homes for the miners. Over one hundred farms to visit and collect rents from, a ranch containing 2,500 acres all fenced, a specialty being made of raising fine cattle, mules and hogs, together with a fine residence for the owner and one also for the Superintendent proved too tempting a bait to the pride and in its last analysis to be more of a hobby with these old gentlemen of ample means than a business proposition; with the result that no effort was made to increase the output of the mines, which could have been done easily many fold.

Recently the Catherine Lead Company entered the field and became possessor of 1,500 acres on which it has sunk two shafts, erected a modern and up-to-date mill, and now producing regularly. During the year the North American Lead Company has come into possession of a good body of land near Fredericktown, sunk a shaft to the 280-foot level and developed a very rich body of the disseminated lead ore. One has only to visit the dump made in excavating this shaft to see the richness of what miners call the dirt. The inspector and his assistant visited during the year a section of the county southwest of Fredericktown, where virtually nothing has been done to prove the territory; yet we secured specimens of the disseminated ore gotten out within a few feet of the surface; a test made of some specimens of what we thought was iron pyrities proved to be copper pyrite. This same section has had considerable shallow mining done in it and the instances where the surface ores have been found are too numerous to mention. The geological area of this section will, in our judgment, when properly developed, prove it a very rich mineral section of the county.

Madison county to-day furnishes more nickel and cobalt from Mine La Motte alone than all other sections of the United States combined. Now that the Catherine mines near Fredericktown has found this valuable ore in its mines the product must be in the near future considerably increased.

Copper ore has not only been mined on the Mine La Motte property, but years ago quite a quantity of it was mined near Fredericktown and within a few hundred feet of the point where the North American Lead Co. has its shaft sunk.

Silver has been found in this county in numerous places south and southwest of Fredericktown, the metal being found in true quartz-filled fissure veins, the most famous of which is known as the Einstein Silver Mine in the southeast quarter of southwest quarter of section 12, township 33, range 5, east.

The deposits of iron ore in this county are numerous and valuable, and some day will be mined with profit.

Marble quarries are numerous in the county and no other district in the State will compare with this section in the variety, beauty, quality and quantity of its building stones, which are shipped and used in some of the finest structures in the Eastern States. With further geological exploration, and a continued development as now appears to have set in, this county, already famous for its mineral resources, will, we believe, become more famous and one of the leaders in the mineral production of the State.

MINE LA MOTTE.

This property is owned by Mr. S. H. Leathe of St. Louis and embraces very nearly 38,000 acres of land, a portion of which is in St. Francois county. During the year 5,200,000 pounds of lead ore and 84,000 pounds of nickel and cobalt was produced, which sold for $155,000. The equipment at the mines and smelter consist of the following: Four shafts were operated duing the year, the depths of which are 100, 118, 160 and 170 feet, respectively. The mill is a complete one, having a capacity of 110 tons per day, the smelting plant consists of calcine ovens smelting stack and refining furnace; there are ten steam boilers, fourteen steam pumps, five steam hoisters, one hydraulic hoister, one crusher and twelve steam jigs in daily use. The mine is unusually free from water; but a good water power is furnished by a reservoir covering 30 acres, which has a head of 70 feet, supplying not only all the water needed in dressing the ore, but acts in all needed purposes the same as a city water works and greatly reduces insurance charges. The mines, while they have been operated without apparent effort to increase the business, yet the management, while the most conservative and modest, has been extra good, no complaints have arisen, no demand has been required for a betterment of the sanitary condition of the mines or for any lack of ventilation and not an accident of any nature to record for many years. Such record speaks volumes, and it is but due Mr. C. F. Stephens, the manager of this property, to make public mention of these facts, gratifying alike to the operator and inspector. The inspector would like to see this great property developed and opened up to the extent that its opportunities warrant and under as good management as has formerly been experienced. It is estimated that the Mine La Motte property has produced to December 31st, 1901, lead ore to the amount of 253,360,000 pounds and valued at $6,334,000, the output having been made from 65 acres of surface work and about 20 acres of deep mining. Considering the estimate made by an eminent geologist that there are 12,160 acres in the lead-bearing group embraced in the Mine La Motte property, it is evident that while mining operations on this tract is old, yet the extraction of the mineral is in its infancy.

CATHERINE LEAD COMPANY.

This company owns the fee to 1,540 acres of mineral land, representing a capital invested in the same amounting to $476,641, and $90,000 of capital invested in plant, with a total capital of $566,641. Mr. H. J. Cantwell is President; S. H. Brickey, Vice-President, and Edwin H. Wagner, Secretary and Treasurer, all of St. Louis. Mr. Wm. Magenau of Fredericktown, Superintendent.

The Catherine is operating two shafts, one having a depth of 100 feet, while the last one sunk has a depth of 160 feet. The ore is carried from the shafts to the mill by an overhead tramway 9,150 feet in length; the tramway was required on account of the mill being located convenient to water facilities on the Little St. Francois river, a flume leading the water from the river to the mill with sufficient fall as not only to aid largely in furnishing power for the mill, but in furnishing all water needed for milling purposes. The mill is a modern equipped plant, supplied with a Corlis engine, 14x36, two boilers, 54x16 feet, two pair of rolls, 14x30, two crushers, 9x15, fourteen steam jigs and four 18-foot slime tables. A Worthington 10-inch triplex pump with a capacity of 1,000 gallons per minute has been installed, also an electric plant for drilling and other purposes.

The production of lead ore amounted to 1,800,000 pounds for the year; but as there was no turn in of the nickel and cobalt mined its value cannot now be given.

THE NORTH AMERICAN LEAD COMPANY.

This company is composed of Columbus, Ohio, parties, with Mr. Joseph F. Davidson as President and Mr. Frank E. Stoneman as Vice-President. The work done by the company so far has been of a preliminary character wholly; drilling with the diamond drill and sinking shafts. There are two shafts on the property; but the main shaft sunk by the company has a depth of 280 feet, in the drifts from which a very rich body of disseminated lead ore was encountered. Preparations have been made for installing a first-class plant and it is expected the year 1902 will show a good output from this tract of land. The new shaft is a very short distance from an old shaft, we are informed, that was worked forty years ago and out of which a large amount of copper ore was hoisted—that copper ore in quantity was mined here is a well established fact. This property reaches very near to the city limits of Fredericktown and excellent transportation facilities will be had on the Belmont Branch of the Iron Mountain Railroad.

With a good output from this mine, the Catherine mines and a little more of the progressive spirit injected into Mine La Motte owners, largely increased production may be looked for from this county.

THE FOLLOWING COLE COUNTY MINING COMPANY, BECAUSE OF NEW ORGANIZATION, GOT IN LATE AND IS OUT OF PLACE ON THAT ACCOUNT.

CHAMBERS MINING COMPANY.

This is an incorporated company and composed of Jefferson City and Centretown parties. Its officers are L. D. Gordon, of Jefferson City, president; B. W. Lansdown, of Centretown, secretary and treasurer, and W. H. Chambers, superintendent. This company has a shaft down 80 feet, from which 10,000 pounds of lead was taken out in the sinking. The company is now drilling to further test its property. The land controlled by this company is two miles south of Centretown, and the showing on it thus far is a flattering one.

Nickel and cobalt are rare and valuable minerals, closely associated and mined in greater quantity at Mine La Motte in Madison county, than in all other sections of the United States combined; and, during the past year, the area in which the minerals have been found in the county has been widened. The Catherine mines some five or six miles south of the former, had quite an output of the mineral, but as this property joins up closely with the Mine La Motte property at its mines, it may be expected to exist on that end of the La Motte land. The demand for the mineral during the year has been such as to increase prices, and with the added importance which Mr. Edisons new nickel storage battery will give it, a still greater demand will be created, and this should be satisfied by the new activities promised in Madison county. That the nickel industry is approaching some important change, is evidenced by the report that both France and Germany are seeking supplies independent of and outside of the trusts.

NICKEL.

The following article is taken from the Century Cyclopedia:

"Chemical symbol, Ni; atomic weight, 58. A metal closely related to cobalt, with which it almost always occurs. The two are, in fact, so much alike that their chemical separation is by no means an easy task. The specific gravity of nickel is given at 8.357 when cast, and 8.729 if rolled; in this and in atomic weight it differs little from cobalt. Nickel and cobalt are also closely allied to iron, which they resemble in color, although slightly whiter than that metal, the former having rather a yellowish tinge, the later a bluish. They are both magnetic, but in less degree than iron. Both also stand on a par with that metal in regard to most of those qualities which make it valuable in the arts, namely, tenacity, malleability, and ductility, but both are so much scarcer than iron that there is no possibility of their replacing that metal to any considerable extent.

The occurrence of nickel (as also of cobalt) in connection with iron in meteorites is interesting and peculiar. (See meteorites.) The native metal of terrestrial origin has been found in only one locality, Fraser river, where it occurs in small flatened grains among the scales of gold. The ores of nickel are somewhat widely disseminated, but nowhere occur in great abundance. The arseniuret (Kupfernickel) and the silicate are the principal sources of this metal, the latter having been found within a few years in considerable quantity in New Caledonia, where it is exceptionally free from cobalt. Nickel was discovered by Cronstedt in 1751; *but it is only within* a few years that it has begun to be of considerable *commercial importance*. Its value has varied greatly since it came into general use. It is an ingredient of certain valuable alloys and especially German silver, and is now much experimented with in this direction. It is largely used for plating iron in order to improve its appearance and preserve it from rusting. It is also somewhat extensively employed in coinage, in the United States, Belgium, Switzerland, Germany and Mexico. Nickel bromide has been used in medicine as an antispasmodic, and the chlorid and sulphate as tonics.

COBALT.

Chemical symbol, Co.; atomic weight, 58.8. A metal of steel-gray color and a specific gravity variously given at from 8.52 to 8.95. It closely resembles nickel, the atomic weight being the same, and their specific gravities nearly or quite the same. They have also very nearly the same ductility and tenacity, are almost always found in intimate association, and have in many respects a marked resemblance to iron, but are less fusible than that metal, and much less magnetic. Cobalt might be, and is to a very small extent, used for the same purposes for which nickel is used, especially for plating the surfaces of iron; but is much rarer than nickel, is procured with more difficulty in the metallic form, and is consequently a dearer metal. The most important ores of cobalt are cobaltite, smaltite, and linnaeits. Cobalt ores occur in a considerable number of localities, but nowhere in large quantity. The chief supply of the cobalt preparations comes from Saxony, Bohemia, Hesse, and Norway. The principal value of cobalt in the arts is due to the fact that its protoxid furnishes an intense and beautiful blue color, of importance in painting, and especially in the decoration of porcelain and glass.

FRANKLIN COUNTY.

More than a century ago mining was prosecuted in this county and at several periods on a very extensive scale. Large sums of money have been made and very large sums have been lost by bad management, while larger sums have been squandered and filched from unsuspecting foreign stockholders by an unscrupulous and designing management. This county has been noted for its rich deposits of ore found in great fissure veins and parallel crevices. During last winter we visited every mine in the county that was operated and many that were not, but at no point were we more interested in our examination than at the Virginia Mine, in section 16, township 41, range 1 east. Its history and the high-handed rascality practiced here in former years, as we are credibly informed, lent interest to us in everything associated with it. Since the discovery of this mine in 1834 to the present this property has produced 27,000,000 pounds of lead. The fissure vein worked at this mine has been followed by a shaft to the 480-foot level, and this same vein has been traced for more than a mile in distance by numerous small shafts. This fissure varied in width from one to fifteen feet and its course was nearly due north and south, the vein matter consisting of baryte clay and lead ore, on its dumps blue baryte crystals have been found. Up to 1844 the property belonged to the public school lands, in that year the Meramac Company secured control and worked the mine for two years, after which it was worked by different lessees until 1873, when it was sold to a New York company, eventually becoming the property of an English syndicate. This syndicate had for its general manager of the mine a man who was known at one time as one of Boss Tweed's right-hand men, and judging from the way he did his foreign stockholders, he was an apt scholar under his old boss. It is claimed that every facility for mining and smelting was furnished the general manager, to the very limit of his requests. A fine residence splendidly furnished was built for the accommodation of the manager out of funds intended for other purposes, a fine stable of blooded horses was secured in the same way. This manager was a confirmed nepotist, and his sons and daughters were cared for in sinecure positions with as good salaries as a kind and loving father would provide, especially under the circumstances. It is hinted that this general manager not only knew the day of arrival, but the very man who, as an expert, was to visit the mines in this country and make report to the English stockholders. Preparation was not only made for this expert's entertainment, but the mines were prepared for his reception, great bodies of ore were blocked out and made ready for the big runs that must be made during his stay; the great piles of pig lead was not all lead, but a kind of veneering in spots. On the arrival of the expert in St. Louis, he must be met by the manager and conveyed in a private car to the nearest point on the railroad from which the mines could be reached. Reports to be made the stockholders by the expert were kindly anticipated by the general manager and made ready for signature at the proper and suitable time. The liberal application of the best of wines and champagnes were used in training this expert how to sign the report and this was not only accomplished, but an earnest request was made for an additional $50,000, with which to supply the additional machinery needed by the enormously increased business being done. All went through without a hitch. Our manager, however, knew this could not in the nature of things go on any longer and feared to squander the $50,000 in machinery and to make himself safe, he absorbed it. Such are the reports one gathers in making inquiry concerning this property. Evidences on the surface point to the very liberal manner in which this mine was supplied with the very best of machinery and every appliance for the rapid handling of the ore and pumping water.

Some distance west of the old Virginia Mine, on the same fissure, a shaft was being sunk by Dr. Reed. At the time some little ore was encountered in the sinking, but as we have not heard from the Doctor, fear the results have not been satisfactory.

BELEW MINING COMPANY.

The Belew Mining Company owns the mineral right on 40 acres of land in the southwest of the southwest quarter of section 1, township 41, north of range 1, east of about 5½ miles south of Moselle. Mr. G. C. McDonald is president, and the postoffice address of the company is Lonedell, Franklin county, Mo. The company is capitalized at $30,000. Its equipment consists of one hand jig plant, two boilers, four steam pumps, one air compressor and two steam hoisters.

This mine is on a fissure vein and two shafts follow the vein to depths of 184 and 205 feet, respectively. The mine during the year was operated 150 days and produced 804,000 pounds of lead ore, which sold for $18,493.67. The improvements during the year embrace the installation of a complete compressed air plant, new boilers, the sinking of an additional shaft, the construction of a new shaft house, and the repair of the old one, the construction of 400 feet of tramway and many lesser improvements.

The walls in this fissure have been known to reach a width of five feet, stulls are used in timbering and most of the waste material is left in the ground. The vein so far shows no change with depth, but it increases in width as the work continues south.

We noticed at the time of our visit a piece of lead ore taken out of this mine and intended for an exhibit at the World's Fair. It was four feet square, and would average about four inches in thickness.

Everything about this mine was in first-class shape, and its management excellent. The superintendent, though comparatively a young man, was fully up to every requirement demanded by his position, and very much interested in his work.

GREAT WESTERN LEAD AND BARYTES MINING COMPANY.

Mr. H. R. O'Neel is president and general manager; A. F. Pilcher, vice-president; P. H. Peterson, secretary and superintendent, and G. W. Jamison, treasurer. This company owns a lease on 226 acres of land, being the northwest part of the southeast quarter and the northwest quarter of section 23, township 41, range 1 west. The capital stock of the company is placed at $100,000. The company sunk four drill holes, 47, 147, 187½ and 200 feet in depth, developing ore in three of the holes. In the 187½-foot hole the drill passed through 97 feet of solid flint without a shine. In the 200-foot hole ore was encountered from 62 to 98 feet. In the 147-foot hole ore was found at the 47-foot level. When we visited the mine the company was still sinking its shaft, having reached a depth at the time of only 70 feet. 10,000 pounds of lead ore was mined out in sinking. The equipment consists of two boilers, steam pump, one 60-horse power Shellenback hoister and a steam jig. This company has a good baryta prospect on its property. The postoffice address of the company is Morrelltown, Mo.

Considerable prospect work was being engaged in near Morrellton. Fisher Bros. of Sullivan, Mo., claim to have struck a good body of lead ore one mile south of town. Mr. Julius Pickles was engaged in some prospect work just west of the Great Western L. & B. M. Co., while to the north of this same company, Mr. Chas. Kemper of St. Louis is having considerable drilling done.

On the same fissure vein, worked by the Belew Mining Co., the Daggett Mine is being operated. The shaft was down 98 feet, and a small amount of drifting done. The fissure at this point was about 14 inches wide. Mr. Sanford B. Daggett, manager.

THE ROCK ISLAND MINING COMPANY.

Mr. Lee Shannon of Rock Island, Ills., is the president of this company. This company is also on the same fissure vein as the Belew. Its shaft reached a depth of 200 feet, having been sunk west of the fissure, and drifts driven to the vein as the shaft went down.

SANGO MINING COMPANY.

The officers of the Sango Mining Co. are: F. B. Tate of Decatur, Ills., president; Wm. H. Stewart of Decatur, Ills., vice-president; Dudley H. Shaw of Decatur, Ills., secretary, and H. R. Ameling of Moselle, Mo., superintendent and treasurer. This company owns 80 acres of land on which two shafts have been sunk, the deepest reaching a depth of 250 feet, with drifts measuring 450 feet in length. It has been a good producer, and worked continuously since 1897. This mine is on a fissure vein that ranges in width from 14 to 38 inches, and located in section 2, township 41, range 1 east. There are numerous small operators securing their ore from shallow diggings, who work so spasmodically that it is difficult to catch them at work. We are compelled for the above reason to secure the output from such parties through the Bartle Lead Co., of

Union, Mo., to which concern we are indebted for much detailed information, which enables us to very closely furnish in our tables on this county the output for the year.

BARTLE LEAD COMPANY.

The Bartle Lead Company owns and operates the smelter at Union, Mo. This company has been of immense benefit to the small operators in Franklin, Washington and Jefferson counties, and with the completion of the new branch of the Chicago, Rock Island & Pacific system it will reach a territory that must prove of great benefit to both smelter and operator.

WASHINGTON COUNTY.

The past year has brought about considerable change in ownership of some very old and well known mining properties.

The American Lead and Baryta Co., having its main office in St. Louis, has acquired the McArthur tract at Patosi; the Shibboleth tract and smelter, and also the Old Mines tract. The McArthur tract did embrace 8,600 acres; Shibboleth, 1,760 acres, and Old Mines tract, 800 acres, in all 11,160 acres; it is reported that the holdings of this company will cover as much as 30,000 acres.

The McArthur Mines, formerly known as Mine a Burton, was discovered in 1763. This property has produced continuously from that time to the present large amounts of lead ore annually, and for many years an immense amount of baryta. The product from this property this year of lead ore was 587,286 pounds of lead ore and 4,646,000 pounds of baryta. Mining on this tract like the other tracts absorbed by the American Lead and Baryta Company, has been on the independent order, that is, the former owners allowed individuals to mine on their property, requiring the miners to deliver the lead to them allowing a certain price for the ore and deducting the royalty. Mr. Hugh McGregor, who has for so many years managed the property, still retains the management.

Old Mines, distant from Potosi about 5 miles and known as Old Mines postoffice, has been noted as a mining camp since 1725, at which time its first mine was discovered. This tract of land has produced regularly each year a large quantity of lead ore and of late years many thousands tons of baryta. Mr. T. S. White superintends this tract for the American Lead and Baryta Company.

The Shibboleth property was purchased by the American Lead and Baryta Co. last August. The property is three miles east of Old Mines, at Cadet postoffice, and has been mined uninterruptedly since the ore was discovered in 1811. During the year, 35 shafts ranging in depth from 40 to 60 feet, have been worked spasmodically, also a number of shallow shafts in the same way. The company now controlling the property has a diamond drill at work near the smelter, where a hole had been drilled 350 deep by Mr. W. W. Moody some years ago. It is the intention, we understand, of the present management to sink this hole deeper, as well as to drill other deep holes with the expectation of finding the disseminated ore. The present company is also sinking two new shafts, their depths at the time we last heard from them was 85 feet. Three furnaces are run regularly, producing about 90 pigs of lead per day.

The auditor of the new company, Mr. W. J. Armbuster, informs us that his company has not as yet directly employed any special number of miners; that some parties living on the land gopher around getting lead ore and baryta for which the company pays them the market prices immediately upon the delivery of the mineral, less a small royalty charged. The lead ore thus delivered to the company is smelted in the company's smelter, nominally charging it to the smelter at the market price of the ore. Should development work meet expectations, the current year will likely add largely to the production of both the lead ore and baryta from this county. This office anticipates much less trouble and a more accurate return of the output from this large body of land than has heretofore been experienced. Mr. W. J. Ellidge of Potosi is the general manager of this company.

THE RENAULT LEAD COMPANY.

This company owns 10,824 acres of land at Palmer. It is capitalized for $300,000, and operates two air furnaces. Mr. Robert Hoskins is superintendent.

These mines have been called the Fourche a Courtois Mines, the Palmer Mines and now Renault Mines. The ore was discovered here in 1725, and since then many thousand tons of lead has been mined. The ore was at first and has for many years since been secured from shallow diggings, a second run of ore at about the 70 foot level was encountered and worked, and a still deeper run which ranged from 100 to 140 feet in depth was worked very successfully.

The production this year was not up to former outputs, which was mainly due to development work in progress during the entire year. With a view to draining the ground and more particularly to open up other bodies of ore, two tunnels are being driven, one 1,200 and the other 1,500 feet in length into the hill and through the old works. These *tunnels are 4x6* feet and should they open up good bodies of ore, old runs of an average of 100,000 pounds per month may again be reached. Some thirty men have been at work sinking shafts and driving the tunnel for which $1.25 per day has been paid. About the same number of men have been working independently in the mines, and are allowed $15.00 per thousand pounds for the lead ore.

THE PITTSBURG MINING COMPANY.

This company owns the 200 acres of land formerly known as the Cyclone Mines, located 7 miles west of Richwood and 27 miles west of De Soto. The company has shaft down to the 175-foot level, and with the equipment, consisting of crusher, rolls, steam jig, 260 horse power boiler, one Ingersoll air compressor, two air drills, steam hoister (Freeman) steam pump and horse hoister, it is prepared to do business. Mr. F. W. Mueller of Fertile is president; T. J. Ebell of New York secretary and treasurer, and C. P. Basyes of Richwood, superintendent.

THE WASHINGTON LAND AND MINING COMPANY.

This company controls a fine body of land in this county, and has a good prospect for a large output of several minerals.

The office of the company is at 611 Wainwright Building, St. Louis. Mr. A. L. Shapleigh is president and Mr. C. B. Burnham, secretary and treasurer. The output from this property during the year was 4,178,980 pounds of baryta, which was sold to St. Louis manufacturers; 63,833 pounds of lead ore, which was sold to smelters outside of Washington county, and 166,700 pounds of copper ore, a portion of which was shipped to Blue Island, Illinois, and the remainder on hand. Zinc ore has been developed on this property, but none of it mined as yet.

Mr. H. J. Cantwell, president of the Columbia Lead Company of Flat River, with office at 624 Roe Biuldiing, St. Louis, has become interested in Washington county. Mr. Cantwell has purchased, within the last eighteen months in this and Crawford counties, 42,000 acres of mineral land, 15,000 acres of which is in Washington and 27,000 acres in Crawford county. It is claimed that some very fine ore has been mined on this property by the farmers for the past 60 years, during the winter months. The ore has been found from the grass roots to 50 and 60 feet as far as they were able to go through the rock.

Mr. T. F. Blount, of Potosi, who is Mr. Cantwell's general manager on this property, intimates that Mr. Cantwell will, in the near future, construct a smelter, erect a supply store and 40 or 50 miners houses, build and supply a saw mill plant and sink some of the shafts deeper to catch the deep veins or runs of ore known to run horizontally between the limestone ledges. The ore found, it is said, will run between 70 and 75 per cent soft Missouri lead after it is hand cleaned. This body of land lies in the southwest part of the county adjoining his land in Crawford county. The fact that Mr. Cantwell has purchased this property, has impressed the people of that section with belief, that the right man to develop their end of the county has at last arrived.

IRONDALE LEAD COMPANY.

This company has secured possession of large bodies of land in this county in the vicinity of Irondale and also in the adjoining county of St. Francois. The usual blank for a report to be made by all operators was mailed to the Irondale Lead Co., at Irondale; the Federal Lead Co., at Flat River, and the Derby Lead Company, at Elvins, the last two located in St. Francois county. Mr. F. W. Scofield, general manager of the Federal Lead Company, made report on each of the above properties, plainly indicating that all three while under different names are yet under one management.

The Irondale Company had five diamond drills running in the neighborhood of Irondale for a year or more. Having demonstrated the presence of the disseminated lead ore, a shaft was sunk to the ore, and when we last visited the mine, drifts were found driven in the ore body for quite a distance in some pretty fair ground. The ore body had not at the time developed a great face, yet we found some very rich ore in the drifts. The company has put in an extra good plant, equipped it with every modern device for handling and treatment of the ore. The capacity of the machinery in every department is ample for conducting a very large business. We hope to receive report of a large output for the current year. The finding of disseminated ore in Washington county has stimulated prospect work in that county beyond all former experience.

The A. F. Carey property proved a good producer during the year, Mr. James Long, of Potosi, purchasing the output and selling it in East St. Louis.

Mr. R. H. Murphy, of Bliss postoffice, is mining on the Kingston tract, with a good prospect for copper and zinc ores.

Mr. Francis Long of Cadet, mined and sold to Z. F. Higginbotham of Fertile, 50,000 pounds of lead during the year. He also mined 3,433,330 pounds of baryta, which he sold to Messrs. Mepham & Klein, of St. Louis.

Washington county produces more baryta than the balance of the State combined, shipments being made from the following points: Blackwell, Cadet, Hopewell, Mineral Point, Old Mines, and Potosi.

JEFFERSON COUNTY.

This is one of the old lead producing counties, one hundred years or more have elapsed since the ore was discovered and mined within its boundaries. The mining, however, is confined to its western and southern borders.

THE VALLE MINING COMPANY.

The Valle Mining Company is the only company or operator reporting to this office this year. The company has $200,000 invested in land and plant, and owns 5,086 acres of land located partly in St. Francois and Jefferson counties, the line between the two counties dividing the property. During the year 25 mines with the shafts leading to them averaging 100 feet in depth, were operated. The equipment embraces 25 horse hoisters, 2 hand jig plants and 1 steam boiler. The product from the mines of this company for the year amounted to 3,122,000 pounds of silicate (zinc) and 902,360 pounds of lead ore, which sold for $44,266.47. This company commenced mining this property in 1824, with exception of some interruption during the war between the states it has mined continuously. The company does not employ miners, neither does it lease its lands; the miners of this section or on this land are permitted to mine on it, but are required to make sale of their product to the company, being allowed a certain price per ton of zinc and a certain other sum per 1,000 pounds of lead ore. The number of men thus engaged on this property during the year was 100.

A very remarkable feature connected with this property is the abundance of zinc produced on it, and the absence of such ore from its closely adjoining territory, owned by the St. Joseph Lead Company, where such an immense product of lead ore is mined annually. From the earliest production of zinc ore to the present time 131,778,000 pounds of the ore has been mined.

Mr. Louis J. Rozier, with postoffice at Valle Mines, Mo., is the superintendent of the company.

There are in the county a number of shallow diggings from which lead ore is mined, but they are so scattered and worked so irregularly that it is next to impossible to catch them at work. We secure the output, however, through the smelters.

AMERICAN "TRIPOLI."

By E. O. Hovey.

Tripoli is a term which was originally applied to an infusorial earth, *resembling clay or* chalk in appearance, coming from the country of the same name in Northern Africa. It crumbles or powders easily between the fingers, is a little gritty to the teeth, and scratches glass when rubbed on it. This earth consists almost entirely of silica in the opal or soluble state, and is made up mainly of the siliceous skeletons of the minute animal organisms known as polycystines or radiolarians, and of the equally minute plant called diatoms. Similar deposits, frequently of great thickness, occur in many other parts of the world, notably in Barbadoes, Sicily, Calabria, Greece, and the Nicobar Islands. The well known "Barbadoes earth" consists mostly of these siliceous skeletons, but contains, besides, a variable proportion of the calcareous shells of Foraminifera. This deposit rises to heights of more than 1,000 feet above the level of the sea, while that of the Nicobar Islands reaches an elevation of about 2,000 feet. According to Haeckel, the eminent German naturalist, there are not less than four hundred, and there may be more than five hundred, species of polycystines in the Barbadoes earth, very many of which "are today extant and unchanged in the radiolerian ooze of the deep Pacific ocean." In Bohemia there is a celebrated deposit of tripoli ("Polir-schiefer"), largely used as a polishing powder, which is composed almost entirely, if not entirely, of the siliceous framework of diaatoms. In the United States there are great deposits of diatomaceous earth, near Richmond, Va., and Monterey, Cal., of which the former is about thirty feet thick, and extends for more than an hundred miles from north to south across the state, while the latter exceeds fifty feet in thickness and is of unknown extent. All the beds noted above are of Tertiary age.

Tripoli is used very extensively in the form of powder as an abrasive, and forms the base of many polishing pastes and other similar preparations. The extreme fineness of the natural grain, combined with the hardness of the individual particles, composed as they are of silica, gives this substance its advantages for this purpose. It is also largely employed in mixing nitro-glycerine in the manufacture of dynamite.

Within a comparatively few years there has developed at Seneca, in the extreme Southwestern corner of Missouri, a large business in the quarrying and manufacture of a rock which is called "tripoli," for want of a better term, and because the material, in some respects resembles what has so long gone by that name. This rock appears to have been derived from the flint of the country rock, which is a cherty lower carboniferous limestone, by some process of decomposition which has left behind a bed of fine grained, rather soft, porous material, which has considerable strength when cut into disks and other forms. This particular deposit is known to underlie between 80 and 100 acres of land, as a rule ellipse, with its longest diameter approximately north and south. Numerous prospect holes show that the the bed is from 10 to 25 feet in thickness, with an average of about 15 feet. The main quarry of the company working these beds at present shows a section 18 feet thick. A well sunk in the northern part of the property gave the following section:

Earth from the surface	4	feet
"Tripoli"	4-20	"
Stiff red clay	20-21½	"
Mixed chert, clay and ocher	21½-40	"
Cherty limestone	40-93	"
Cherty limestone, bearing galenite	93-103	"
Limestone	103-128	"
Limestone, bearing galenite and sphalerite	128-126	"
Soft magnesian limestone	136-173	"

The drill was lost in this soft rock at about 173 feet. The first 53 feet of the well was sunk by digging, the remainder by using a six-inch plunger drill.

Not only is the bed of tripoli everywhere underlaid by a relatively thin stratum of very stiff red clay, but it is transversed in every direction by seams one to two inches thick of the same substance. These seams and other joints divide the rock into masses which vary in size up to thirty inches or more in diamerter. In color the material varies from an almost pure white, through a cream tint, to a delicate rose, depending probably, on a difference in the small amount of iron present.

The rock is very even in texture, and is so minutely porous that it forms a most excellent natural filter. Last year (1893) the American Tripoli Company, which owns and operates this deposit, put on the market more than 20,000 disks, cylinders and blotters. These articles are patented.

A second and fully as important a branch of this industry is crushing the rock and grinding it into flour, for use in polishing all kinds of metals, horn, shell, etc. The company grinds the rock in a common mill, between burr stones, and sifts it through two bolts of 70 and 120 mesh, similar to those used for bolting wheat flour. Last year the company sold upward of 20,000,000 pounds of this ground and bolted tripoli flour.

A portion was scraped off from a crude piece of the rock and mounted for the microscope. Examination with powers magnifying 450 diameters failed to show any remains of the skeletons of radiolarians or diatoms. The particles were extremely minute, by far the most of them being not over 0.01 mm. (0.0004 inches) in diameter, though an occasional grain measured 0.05 mm. through. The particles are doubly refacting, and are probably chalcedony, while the infusorial tripoli consists of opaline silica.

The credit of developing this industry is due to Mr. T. T. Luscombe, of Carthage, Mo., who is president of the American Tripoli Company. The quarries were first operated in 1872, but the greater growth of the business has been within a very few years. The company received a medal awarded at the World's Fair, Chicago.—*Scientific American.*

The following tables furnish the output of iron ore, baryta and tripoli for the year. With the completion of the new Rock Island Road from St. Louis to Kansas City, extensive fields of all three products will be opened up.

IRON.

County.	Tons.
Crawford	5,640
Dent	60,000
Franklin	390
Iron	90
Oregon	60
Phelps	720
St. Francois	73,389
	140,280

BARYTA.

County.	Tons.
Cole	90
Jefferson	15
Miller	123
St. Francois	10,410
Washington	21,750
	32,388

TRIPOLI.

County.	Pounds.
Newton	2,660,000

TABLE III.

Showing by counties, plant, employes, tonnage, prices and value of the lead and zinc product of Missouri for the year ending December 31, 1901.

County.	Acres of land leased or owned........	Amount of capital............	No of shafts....	Average depth of shaft.......	Tons of zinc ores		Price rec'd for		Tons lead ores.		Price rec'd for		Receipts from		Total amount received for both lead and zinc...........
					Zinc......	Silicate...	Zinc......	Silicate...	Lead......	Dry-bone.	Lead......	Dry-bone.	Zinc ores.	Lead ores.	
Barry	80	$1,800	6	53	5	111	$20 00	$10 00					$1,210		$1,210
Benton	86	27,000	2	125	240		20 00		106		$45 18		4,800	$4,789	9,589
Cole	145	2,800	3	55					106		44 34			4,700	4,700
Christian	10	800	1	135		11		17 00	180		43 70		187	7,868	8,055
Franklin	266	130,000	3	160					1,007		49 27			49,628	49,628
Greene	89	22,000	2	90	240	234	23 00	12 75	108		42 43		8,582	4,582	13,164
Jasper	11,938	7,269,511	611		177,463	677	24 54	12 23	23,664	318	45 67	$25 54	4,371,282	1,089,571	5,460,853
Jefferson	5,000	200,000	25	100		1.561		12 75	701		53 47		19,902	37,492	57,394
Lawrence	1,323	944,500	82	102	11,339	6,451	24 08	13 50	675		44 28		351,041	29,703	380,744
															*5,964
Madison	39,540	1,366,641	6	150					3,500		52 80			185,036	185,036
Miller	271	5,600	2	132					61		44 28			2,711	2,711
Moniteau	400	25.000	1	125	231		31 00		548		51 00		7,161	27,979	35,140
Morgan	400	19,000	4	70	105		26 25		84		43 50		2.758	3,600	6,418
Newton	11.364	495,854	96	92	16,765	7,154	22 65	18 77	3,502	503	46 60	23 13	513,062	175,073	688,135
St. Francois	21,437	7,900,000	21	345					72,428		43 60			3,119,389	3,119,389
Washington	19,424	300,000	30	60					1,834		46 25			84,749	84,749
Camden									65		44 00			2,860	2,860
Crawford									200		44 50			8,900	8,900
Dade					410		23 42		90		44 35		9,602	3,991	13,593
Hickory					340		23 75						8,075		8,075
Howell						640		13 80					8,832		8,832
Webster					69		22 70		52		42 43		1,566	2,206	3,772
Wright					27		22 65		110		42 80		611	4,708	5,319
	111,773	$18,710,506	895		207,234	16,839			109,021	821			$5,308,671	$4,849,595	$10,164,230

*Mine LaMotte, 42 tons Nickle and Cobalt @ $142.00=$5,694.00.

TABLE III—Continued.

Counties.	Employes.		No. days worked producing.	No. days development work.	No. men prospecting.......	Wages paid miners........	Wages paid other help....	Machinery employed.									
	Miners...	Other help.....						Concentrating plants...	Hand jig plants...	No. boilers.......	No. steam pumps ..	No. air-compressors......	No. steam hoisters.	No. horse hoisters.	No. crushers.......	No. steam jigs......	No. hand jigs......
Barry	11	8	110	340	5	$1 50	......	2	1	3	1	......	2	2	2	2	4
Benton	13	11	150	300	......	1 75	$1 50	2	1	4	3	1	2	1	2	2	4
Cole	6	2	86	140	2	1 50	1 25	......	1	1	1	......	......	1	......	......	2
Christian	4	2	25	25	......	2 00	1 25	1	......	1	1	......	1	......	1	1	......
Franklin	23	18	150	420	11	1 75	1 25	......	1	2	5	1	3	......	......	5	2
Greene	13	8	150	220	......	1 75	1 25	1	2	3	2	......	2	2	1	1	5
Jasper	3,843	1,633	26,418	12,549	612	......	......	270	257	607	368	73	447	272	297	475	545
Jefferson	100	16	110	......	......	1 50	1 25	......	2	1	......	......	......	25	......	......	2
Lawrence	432	193	3,704	2,180	47	1 75	1 25	27	26	58	43	3	50	31	28	43	85
Madison	218	150	463	145	......	1 50	1 40	2	......	13	17	......	8	......	3	26	1
Miller	5	10	90	239	7	1 50	1 25	......	1	2	1	......	2	......	......	......	3
Moniteau	6	5	126	258	10	1 75	1 25	......	1	1	2	......	1	......	......	......	3
Morgan	4	5	170	230	30	1 50	1 25	......	2	3	2	......	1	3	......	......	......
Newton	567	196	2,756	1,720	124	1 65	1 50	19	56	78	60	2	72	56	22	69	106
St. Francois	1,353	1,117	1,804	......	4	1 65	1 25	6	......	89	69	22	27	......	59	459	......
Washington	30	110	300	300	25	1 50	1 25	......	......	1	2	......	......	5	......	......	......
Camden	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Crawford	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Dade	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Hickory	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Howell	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Webster	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Wright	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
	6,628	3,484	36,612	19,066	877	......	......	330	351	867	578	102	618	398	415	1,083	762

TABLE IV.

Average price of pig lead and spelter in New York for the eighteen months ending December 31, 1901.

Month and years.	Pig lead per 100 pounds.	Spelter—cents per pound.
July, 1900	$4 03	4.28
August, 1900	4 25	4.17
September, 1900	4 35	4 11
October, 1900	4 35	4.15
November, 1900	4 35	4.29
December, 1900	4 35	4.25
January, 1901	4 35	4.13
February, 1901	4 35	4.01
March, 1901	4 35	3.91
April, 1901	4 35	3.98
May, 1901	4 35	4.04
June, 1901	4 35	3.99
July, 1901	4 35	3.95
August, 1901	4 35	3.99
September, 1901	4 35	4.08
October, 1901	4 35	4.23
November, 1901	4 35	4.29
December, 1901	4 15	4.31
Average for the 18 months	$4 31	4.12

Average price of lead last six months of 1900	4.26
Average price of spelter last six months of 1900	4.21
Average price of lead for the year 1901	4.33¼
Average price of spelter for the year 1901	4.08

TABLE V.

Zinc Price of Common Western Spelter in New York, 1875, to December 31, 1901, Inclusive.

[Cents per pound. Figures in parentheses are combination prices.]

Years.	January.		February.		March.		April.		May.		June.		July.		August.		September		October.		November.		December.		Year........
	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	Highest...	Lowest...	
1875	6.75	6.37	6.25	6.25	6.50	6.20	(7.00)	6.50	(7.25)	7.15	(7.25)	7.15	(7.35)	7.25	(7.25)	7.10	(7.25)	7.10	(7.40)	7.15	(7.40)	7.15	(7.40)	7.15	7.00
1876.	(7.60)	7.40	(7.75)	7.50	(7.75)	7.62	(8.00)	7.60	(8.00)	7.75	(8.00)	7.25	7.25	7.12	7.25	7.80	7.12	6.80	6.75	6.62	6.62	6.37	6.50	6.37	7.25
1877..........	6.50	6.25	6.62	6.50	6.50	6.37	6.37	6.25	6.25	6.00	6.12	5.87	5.87	5.62	5.90	5.80	5.87	5.75	5.90	5.70	5.87	5.62	5.75	5.50	6.03
1878..........	5.75	5.50	6.62	5.25	5.62	5.25	5.25	5.00	5.00	4.62	4 62	4.25	4.75	4.50	4.87	4.50	4.87	4.75	4.82	4.50	4.75	4.50	4.37	4.25	4.88
1879..........	4.50	4.25	4.62	4.40	4.62	4.37	4.75	4.25	4 50	4.25	4.37	4.12	4.75	4.37	5.62	4.80	6.00	5.62	6.37	6.00	6.25	5.87	6.25	6.00	5.036
1880	6.50	5.87	6.75	6.37	6.75	6.50	6.50	6.12	6.00	5.62	5.50	5.12	5.00	4.87	5.25	4.87	5.12	4.75	5.00	4.87	4.90	4.65	4.75	4.65	5.51
1881..........	5.25	4.87	5.25	5.12	5.00	4.87	5.12	4.75	5.00	4.87	5.00	4.75	5.00	4.75	5.12	5 00	5.25	5.00	5.37	5.25	5.87	5.50	6.00	5.87	5.243
1882..........	6.00	5.75	5.75	5.62	5.62	5.37	5.50	5.25	5.62	5.25	5.37	5.25	5.37	5.12	5.50	5.12	5.37	5.12	5.37	5.12	5.12	4.87	4.87	4.50	5.325
1883..........	4.62	4.50	4.62	4.50	4.75	4.62	4.75	4.60	4.75	4.50	4.62	4.37	4.50	4.30	4.40	4.30	4.50	4.40	4.45	4.35	4.40	4 37	4.37	4 35	4.595
1884.	4.87	4.20	4.40	4.25	4.60	4.40	4.65	4.50	4.60	4.45	4.80	4.45	4.55	4.45	4 62	4.52	4.62	4.50	4.55	4.40	4.40	4.30	4.25	4.00	4.443
1885.	4.50	4 12	4.30	4.25	4.30	4.12	4.30	4.12	4.25	4.10	4.10	4.00	4 40	4.10	4.60	4.40	3.62	4.50	4.62	4.50	4 60	4 45	4.60	4 45	4.345
1886..........	4.50	4.30	4.55	4.30	4.60	4.50	4.60	4.50	4.60	4.40	4.40	4.35	4.40	4.30	4.10	4.30	4.40	4.25	4.30	4.25	4.30	4.25	4.50	4.35	4.40
1887..........	4.60	4.50	4.60	4.40	4.60	4.40	4.65	4 45	4.65	4.45	4.65	4.50	4 50	4.50	4.60	4.55	4.65	4.60	4.65	4.50	4.80	4.52	5.87	5 00	4.625
1888..........	5.37	5.20	5.35	5.25	5.25	4.87	4.87	4.60	4.65	4.60	4.60	4.50	4.55	4.50	4.87	5.40	5.12	4.75	5.12	4.87	5.12	4.87	5.12	4.87	4.91
1889..........	5.00		4.95		4.75		4.675		4.75		4.975		5.10		5.20		5.175		5.10		5.20		5.40		5.023
1890..........	5.41		5.28		5.187		5.085		5.35		5.575		5.55		5.76		5.600		6.012		6.122		6.106		5.55
1891	5.55		5.025		5.125		5.000		5.85		5.083		5.063		5.01		4.958		5.02		4.83		4.75		5.02
1892	4.69		4.62		4.89		4.68		4.79		4.71		4.78		4.69		4.53		4.41		4.47		4.40		4.63
1893	4.39		4.33		4.28		4.38		4.41		4.27		4.13		3.89		3.69		3.68		3.65		3.89		4.075
1894..........	3.56		3.85		3.89		3.62		3.47		3.40		3.43		3.38		3.44		3.45		3.36		3.43		3 52
1895	3.28		3.20		3.23		3.30		3.50		3.65		3.75		4.15		4.30		4.10		3.55		3.49		3.63
1896	3.75		4.03		4.20		4.09		3.98		4.10		3.97		3.76		3.60		3.76		3.86		4.10		3.63
1897..........	3.99		4.019		4.156		4.15		4.18		4.28		4.32		4.26		4.18		4.17		4.03		3.89		4.13
1898..........	3.96		4.04		4.25		4.26		4.27		4.77		4.66		4.58		4.67		4.98		5.29		5.10		4.57
1899..........	5.34		6.28		6.31		6.67		6.88		5.98		5.82		5.65		5.50		5.32		4.64		4.66		5.75
1900	4.65		4.64		4.60		4.71		4.53		4.29		4.28		4.17		4.11		4.15		4.29		4.25		4.39
1901..	4.13		4.01		3.91		3.98		4.04		3.90		3.95		3.99		4.08		4.23		4.29		4.31		4.08

St. Louis prices are usually .03 below New York prices.

TABLE VI.

Showing the zinc ore product of Missouri from the year 1873 to 1901, inclusive, together with the average price received each year for the ore and total value of same.

Year.	No. of tons.	Average price.	Am't rec'd for output.	Year.	No. of tons.	Average price.	Am't rec'd for output.
1873........	960	$9 00	$8,640 00	1888	61,550	21 00	$1,292,550 00
1874	5,100	10 00	51,000 00	1889......	82,357	21 44	1,765,734 08
1875........	3,600	12 00	36,000 00	1890	100,248	22 51	2,256,583 00
1876...	11,300	13 50	148,000 00	1891	123,752	21 60	2,673.063 36
1877........	10,000	14 00	140,000 00	1892......	131,488	21 76	2,862,475 08
1878	12,000	16 50	198,000 00	1893......	108,591	20 57	2,245,028 80
1879........	20,000	17 00	340,000 00	1894......	89,150	15 00	1,337,910 36
1880	27,500	16 00	440,000 00	1895.... .	101,294	16 86	1,707,665 40
1881........	35,500	16 50	579,150 00	1896	92,754	19 75	1,831,856 45
1882...	34,900	16 90	589.100 00	1897......	93.148	18 62	1,706,947 53
1883	35,700	17 50	624,750 00	1898......	139,668	20 96	2,927,321 00
1884........	43,200	18 00	777,600 00	1899:.....	181,430	32 93	5,974,624 00
1885	42,200	17 50	738,500 00	1900......	186,293	30 66	5,711,631 00
1886........	48,400	18 50	895,400 00	*1900.....	105,150	26 97	2,835,895 00
1887........	57,300	19 00	1.088,700 00	1901......	224,074	23 70	5,308,671 00
				Totals	2,211,307	$22 20	$49.092,796 00

* For ten years prior to 1901. the above figures covered a fiscal year ending June 30th. The six months accounted for above is the last six months of 1900, making full years for the period.

TABLE VII.

Showing the number of employes, equipment, tonnage and value of the lead and zinc product of Jasper county for the year 1901.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ore.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Aida Mining Co. No. 1	Aida Mining Co. No. 1	10	$6,000	2	220	1,305	....	$26 00	....
2	Ajax Lead and Zinc Mining Co.	Ajax Lead and Zinc Mining Co.	30	8,000	2	170	703	....	25 55	....
3	Ashcraft Reynolds Mining Co.	Not being operated	43½	20,000	5	140	8	....	25 47	....
4	American Zinc, Lead and Smelting Co.	Center Valley tract	120	50,000	12	150	3,747	....	23 00	....
5	" " "	Cornfield tract	80	40,000	12	180	9,928	....	22 50	....
6	" " "	Davey tract	40	40,000	2	200	2,124	....	23 75	....
7	" " "	Interurban tract	40	10,000	3	80	586	5½	24 00	$10 50
8	" " "	Lone Lady tract	20	10,000	4	80	149	....	23 80	....
9	" " "	Midway tract	60	20,000	6	120	2,866	35½	22 35	9 00
10	" " "	Missouri Central tract	56	10,000	4	110	69	....	24 50	....
11	" " "	Porter tract	20	5,000	5	35	36	8	20 00	10 50
12	" " "	Richland tract	30	50,000	4	175	709	....	23 13	....
13	Arkansas Mining Co.	R. S. Morris	40	15,000	6	140	77	....	27 50	....
14	Bailey & Stickney	Bailey & Stickney	200	4,000	1	140	32	....	29 50	....
15	B. and C. Mining Co	A. W. Oustott & Co	10	25,000	1	190	577	....	26 00	....
16	Bankers' land	A. C. Brewington & Co	5	2,000	1	90	4	....	24 00	....
17	Barbee & Yale	T. L. Yale	40	10,000	2	120	120	....	23 73	....
18	Bay State Zinc Mining Co.	Bay State Zinc Mining Co.	48	....	3	160	787	....	26 50	....
19	Beckwith-Hall Mining Co	Richmond Mining Co.	4	10,000	1	200	600	....	24 50	....
20	" "	Opal Wonder Mining Co.	10	6,000	1	155	200	....	20 00	....
21	Becky Sharp Mining Co	Worked by scrappers	40	4,000	....	...	15½	....	26 84	....
22	Bellville Land and Mining Co	Bellville Land and Mining Co.	160	....	1	40	100	....	22 21	....
23	Big Bug Mining Co	Theo. M. Nutz	3	....	1	65	14	....	25 00	....
24	Big Six Developement Co	W. D. & W. Mining Co.	4	....	1	175	164	....	24 00	....
25	" "	Fairview Mining Co.	6	5,000	1	200	2,255½	....	24 50	....
26	Binghampton Zinc and Lead Mining Co.	Binghampton Zinc and Lead Mining Co.	20	....	4	90	53½	....	24 50	....
27	Blue Wing Mining Co.	Blue Wing Mining Co., includes some work done by International	25	....	3	140	560	....	24 20	....
28	Boston Get There Mining Co.	Boston Get There Mining Co.	40	225,000	3	180	1,885½	....	22 78	....
29	" " "	Morton Mining Co.	2	5,000	1	180	181	....	24 00	....
30	Boston Dueneweg Mining Co.	Boston Duneweg Mining Co	155	....	8	130	968½	....	20 76	....

31	Boqua Mining Co	Boqua Mining Co	70	20,000	4	141	1,404		25 88	
32	Bradford K. C. Lead and Mining Co	Bradford K. C. Lead and Mining Co	40	32,000	1	115	304		18 70	
33	Brinkley lease	Shayler & Morgan	10	1,000	1	170	43		22 26	
34	Bunco Mining Co	W. P. Howard	29	15,000	2	105	404		24 00	
35	Budweiser Mining Co	H. M. Brewer	40	4,000	1	135				
36	Burgner Mining Co	Burgner Mining Co	80	18,000	3	155	184		17 83	
37	Center Creek Mining Co	Center Creek Mining Co	200	1,239,151	35	140	7,557		20 97	
38	Colonial Zinc and Lead Mining Co	Colonial Lead and Zinc Mining Co	33	20,000	1	135	26		23 40	
39	Colorado-Joplin M. & M. Co	S. T. Nesbitt	70	40,000	7	130	175		27 50	
40	Continental Zinc, Lead and Smelting Co	Continental Zinc, Lead and Smelting Co	200	550,000	14	175	6,777		26 95	
41	Crown Crest Zinc and Lead Mining Co	Crown Crest Zinc and Lead Mining Co	107	125,000	10	105	80	200	26 68	11 60
42	Davey & Son	Davey & Son	80		9	120	1,776		21 80	
43	Della "S"	Ground & Patten	80	3,000	1	178	200		30 00	
44	Dinkebeihler lease	J. J. Dinkebeihler	60	50,000	2	75	533		28 50	
45	East Hollow Mining Co	East Hollow Mining Co	140	20,000	5	115	419		24 00	
46	Eclipse Land and Mining Co	Eclipse Lead and Mining Co	180	20,000	4	180	52		29 00	
47	" " "	F. M. Spoьable, Hoo-Hoo	8	16,000	1	192	37		30 00	
48	Eldorado Mining Co	Eldorado Mining Co	28	48,000	6	155	1,265		20 91	
49	Eleventh Hour Mining Co	Eleventh Hour Mining Co	120	10,000	7	175	2,140		22 13	
50	Empire Zinc Co	Empire Zinc Co	200		16	100	555		22 86	
51	Estrada lease	Rafel Estrada	80		2	136	1,431		27 11	
52	Freeman Land and Mining Co	Freeman Land and Mining Co	80	20,000	1	150	1,195		29 00	
52½	Forrestal & O'Donnell	Geo. K Hubbard	40	3,000	2	230	603		28 00	
53	Funk & Bowman	Funk & Bowman	2	1,200	1	200	28		23 00	
54	Gilchrist-Porter R. Co	Zolo Mining Co	20	5,000	5	120	560		27 51	
55	Granby Mining and Smelting Co	G. M. & S. Co at Joplin	998	100,000	25	110	8,082		24 32	
56	" " "	G. M. & S. Co. at Oronogo	1,280	100,000	24	140	12,931		25 04	
57	Hagardon, R	R. Hagardon	30	10,000	4	100	73		23 00	
58	Harrison, J. W	J. W. Harrison	2	2,000	1	140	20		23 00	
59	Holden Bros	Holden Bros	40	6,000	5	120	342		24 79	
60	Homestead Lead and Zinc Co	Homestead Lead and Zinc Co	80	20,000	3	180	1,952		26 00	
61	Hudson Mining Co	Hudson Mining Co	16	15,000	1	210	871		30 00	
62	Ihlseng Mining Co	Ihlseng Mining Co	20	10,000	7	110	1,243		23 63	
63	I Know Mine	I Know Mine	1	3,000	1	165	47		24 50	
64	Imperial Mining Co	E. H. Shattuc	11	5,000	1	160	880		27 46	
65	Independence Mining Co	Independence Mining Co	106	50,000	1	164	604		27 54	
66	Indiana Mining Co	W. H. Gross & Co	40	8,000	1	147	13		23 00	
67	Investors' Mining Co	Investors Mining Co	40	7,000	1	200	464		25 42	
68	Ishpeming Mining Co	Ishpeming Shaft A	10	5,000	1	149	952		23 66	
69	" "	" " B	10	14,000	1	46				
70	" "	" " C	10	6,000	1	115	1,086		26 98	
71	" "	" Frisco	80	5,000	1	147	204		24 41	
71½	Joplin Prospecting Co	Lessees	40	4,800	2	150	264		24 60	
72	Jeanette Mining Co	J. H. Dangerfield	37	6,000	1	140	261		26 00	
73	John Jackson Mining Co	John Jackson Mining Co	51	105,000	2	148	1,740		24 24	
74	" "	Jack Johnson Mining Co	6	10,000	1	180	545		25 77	
75	Jim Jackson Mining Co	Jim Jackson Mining Co	5	2,000	1	185	623		23 68	
76	Katy "C" Mining Co	Katy "C" Mining Co	5	8,000	1	217	874		29 00	
77	Lead Hill Mining Co, Joplin	Lead Hill Mining Co	40	20,000	4	140	726		22 20	
78	Lead Hill Mining Co., Carthage	Lead Hill Mining Co	40	2,000		90	9	20	17 08	13 25
79	Leonard Mining & R. Co	Leonard Mining and R. Co	120	160,000	12	150	3,134		21 50	
80	Lincoln Mining Co	Lincoln Mining Co	70	30,000	3	130	2,660		25 00	
81	Leckie Mining Co	Leckie Mining Co	40	1,200	4	80	53		26 50	
82	Lucky Tom	Frank Stafford	6	6,000	1	160	1,350		20 00	

ENPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
83	McConnell Mining Co.	McConnell Mining Co.	4	$300	1	116	....	....	....	....
84	Mallett & Freeman	Lessees	40	5,000	1	110	323	....	$24 00	....
85	Mistletoe Mining Co.	Mistletoe Mining Co.	40	17,000	1	185	2,580	....	26 75	....
86	McKinley Mining Co.	McKinley Mining Co.	60	110,000	7	195	543	....	21 90	....
87	" "	Aida Mining Co. No. 2	7	15,000	1	209	1,585½	....	26 70	....
88	" "	Maud B. Mining Co.	4	10,000	1	210	2,063	....	27 10	....
89	" "	Goodenough Mining Co.	2	10,000	1	180	190	....	23 55	....
90	" "	C. L. Ashcraft	2	5,000	1	200	92	....	22 25	....
91	" "	Dell "C." Mining Co.	5	7,500	1	203	393	....	19 50	....
92	" "	Old Lead Shaft	2	2,500	1	110	....	....	....	....
93	McMillan & Raymond	McMillan & Raymond	30	39,000	3	90	1,653	....	26 50	....
94	Manhattan Mining Co.	Manhattan Mining Co.	40	25,000	3	146	171	....	24 20	....
95	" "	Sullivan & Young	2	50	1	65	....	....	....	....
96	" "	Watson & Mehaffy	2	100	1	70	....	....	....	....
97	Massassoit Mining Co.	Massassoit Mining Co.	95	75,000	8	120	992	....	24 50	....
98	Mignonette Mining Co.	Waddell & Co.	24	25,000	1	175	1,571	....	27 00	....
99	Missouri Lead and Zinc Co.	Sub-lessees	1,200	300,000	43	20 200 90	5,068	361	24 37	$12 80
100	Missouri Zinc Fields Co.	Lessees	440	400,000	18	210	5,598	....	21 74	....
101	Mohaska Mining Co.	"	160	10,000	2	50	33	....	24 00	....
102	Montgomery Lead and Zinc Co.	"	200	10,000	3	80	469	....	24 00	....
103	Mount Ararat Mining Co.	Mount Ararat Mining Co.	10	20,000	4	174	1,884	....	24 00	....
104	Neeley Mining Co.	Neeley Mining Co.	20	5,000	2	205	124	....	25 80	....
105	North Heights M. and M. Co.	North Heights M. and M. Co.	4	10,000	3	100	105	....	26 00	....
106	" "	D. K. Hartz	20	2,000	3	100	283	....	24 00	....
107	North Joplin Mining Co.	W. H. Landreth & Henry C. M. Co.	40	2,000	1	114	24¼	....	25 20	....
108	Old Colony Zinc and Smelting Co.	L. W. Winter	362	180,000	5	210	2,330	....	24 00	....
109	Olympia Zinc Co.	Olympia Zinc Co.	80	25,000	1	145	72	....	23 00	....
110	Owensboro-Joplin Mining Co.	Owensboro-Joplin Mining Co.	40	25,000	1	100	291	....	24 89	....
111	Oxford Mining Co.	Oxford Mining Co.	200	8,000	...	...	172	....	24 25	....
112	" "	Hazel Mining Co.	6	500	1	100	8	....	24 42	....

113	" "	Pee Wee Mining Co.	5	500	1	85	30		25 28	
114	" "	Long String Mining Co.	5	1,000	1	100	4		25 93	
115	" "	Cheap Screw Mining Co.	5	500	1	80	151⅓		25 79	
116	" "	Mastadon & Pecan Mining Co	12	8,000	3	105	109½		25 56	
117	" "	Gold Shield Mining Co.	10	2,000	1	120	623⅓		26 82	
118	" "	D. Shaft	10	4,000	1	123	1,088		26 89	
119	" "	Desplaines Mining Co.	5	6,000	1	103	2,004		26 18	
120	" "	Little Giant Mining Co.	5	2,500	1	65	460		26 38	
121	Parker & Johnson.	Johnson, Willett & Co.	2	10,000	2	156	301		25 27	
122	Perkins Zinc Co.	Perkins Zinc Co.	40	20,000	4	160	467		30 00	
123	Perry Lease Mining Co.	Sub-lessees.	190	75,000	12	104	2,705		24 00	
124	Phelps & Connor.	O. B. Lane	20	5,000	1	185	28		27 31	
125	Pleasant Valley Mining Co.	Pleasant Valley Mining Co.	40	40,000	2	180	600		26 00	
126	Plutocrat Mining Co	Plutocrat Mining Co	40	16,000	1	200	108		24 81	
127	Plymouth Rock Mining Co.	Plymouth Rock Mining Co.	20	10,000	2	128	927		25 28	
128	Porto Rico Mining Co.	W. J. Ground & Co.	80	4,000	8	100	1,628		24 00	
129	Quaker Mining Co.	Holmes, Cope & Co	52	10,000	7	130	900		26 66	
130	Rabbit's Foot Zinc Mining Co	Rabbit's Foot Zinc Mining Co.	40	12,000	1	102	1,160		25 86	
131	Rannabarger Mining Co.	Lessees.	30	30,000	2	170	6		25 00	
132	Regan Land	Regan Land	80	2,000	3	120	30½		19 66	
133	" "	Gate City Mining Co.	40	1,000	1	140	4		18 00	
134	" "	M. J. McClurg et al	48	1,000	1	185	183		22 00	
135	Rex Mining Co.	Lessees.	1,006	230,000	8	75	806	25	25 00	12 47
136	Roaring Springs Mining Co.	Roaring Springs Land and Mining Co.	208	20,000	3	110	2,500		26 00	
137	Roberta Mining Co.	Roberta Mining Co.	40	10,000	1	225	325		25 40	
138	Sergent Mining Co.	Sergent Mining Co.	4	3,000	1	200	155		27 00	
139	Sharpsburg Mining Co.	Sharpsburg Mining Co.	40	12,000	1	225	462		24 42	
140	Short Creek Mining Co.	Short Creek Mining Co.	70	2,500	2	65	145		22 00	
141	South Joplin Land Co.	New York Superior.	40	6,000	6	180	410		22 00	
142	South Joplin Mining Co.	Lessees.	40	5,000	1	120	384		24 00	
143	Spencer, C. H.	"					297		23 29	
144	Sphinx Mining Co.	Sphinx Mining Co. and Lessees	32	70,000	3	190	2,053		26 00	
145	Springer & Page.	Springer & Page.	80	50,000			349		25 25	
146	Stuckey Mining Co.	Stuckey Mining Co.	72	7,000	5	65	150		25 00	
147	Sultana Mining Co.	Sultana Mining Co.	5	8,000	1	180	1,245		28 00	
148	Ten O'Clock Mining Co.	B. C Ayler	10	6,000	1	97		19		13 98
149	Triad Mining Co.	Triad Mining Co.	40	10,000	3	100	126		26 00	
150	Troup Mining Co.	Troup Mining Co.	40	160,000	4	175	1,772		27 00	
151	United Zinc Companies	Cock Robin Mining Co.	13½	10,000	1	131	280		25 00	
152	" " "	Bob Ingersoll Mining Co.	8	27,000	1	180	1,057		25 00	
153	" " "	King Jack Mining Co.	8	150,000	1	148	2,362		27 00	
154	" " "	Lackawana Mining Co.	10	50,000	2	140	2,408		26 16	
155	" " "	Gibson Girl Mining Co	4	20,000	1	150	75		25 50	
156	" " "	W. Armington Mining Co.	2	5,000	1	160				
157	" " "	Conqueror Mining Co.	14	27,500	3	140	1,643		27 00	
158	" " "	Pelican Mining Co.	10	15,000	6	164	2,244		26 00	
159	" " "	Deep Rock Mining Co.	4	10,000	1	165	373½		28 50	
160	" " "	Ft. Wayne Mining Co.	7	25,000	1	195	416		25 00	
161	" " "	Moonshine Mining Co.	56	14,000	2	40	28		24 00	
162	Venture Mining Co.	Venture Mining Co.	320	350,000	2	157	777		26 00	
163	Warren Lead and Zinc Co.	Warren Lead and Zinc Co.	4	15,000	1	149	143		28 00	
164	West Hollow Mining Co.	Lewellyn Bros.	150	25,000	11	100	198		25 50	
165	West Joplin Lead and Zinc Co.	Portland Mine and Foster & Gray.		5,000			502		25 00	
166	Weyman & McConey.	Weyman & McConey.	10	15,000	2	140	196		19 32	

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores. Zinc	Tons of zinc ores. Silicate	Price received for Zinc	Price received for Silicate
167	Witch Hazel Mining Co.	Moore & Co.	10	$1,000	1	90	22	....	$22 50	....
168	Woodward Mine	G. O. Ashcraft	7	7,000	1	180	1,000	....	22 00	....
169	Wright Mining Co.	F. L. Yale	22	10,000	2	155	659	....	25 15	....
170	Yale & O'Brien	Yale & O'Brien	40	8,000	2	140	246	....	24 13	....
171	Product mines worked part year now defunct	....	....	....	...	......	4,748	....	25 15	....
172	Product Sludge Mills not otherwise reported	....	....	....	...	......	3,876	....	25 05	....
			11,938	18,710,506	611	......	177,463	677	$24 53	....

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Aida Mining Co. No. 1	Aida Mining Co. No. 1	38		$46 00		$33,931	$1,748	$35,679
2	Ajax Lead and Zinc Mining Co.	Ajax Lead and Zinc Mining Co.	43		44 28		17,969	1,904	19,864
3	Ashcraft-Reynolds Mining Co.	Not being operated	3		45 20		204	136	340
4	American Zinc, Lead and Smelting Co.	Center Valley tract	282¼		44 00		86,181	12,421	98,602
5	" " "	Cornfield tract	1,769½		46 00		223,380	81,381	304,761
6	" " "	Davey tract	657		45 50		50,466	29,792	80,258
7	" " "	Interurban tract	10½		45 15		14,121	474	14,595
8	" " "	Lone Lady tract	4		46 75		3,546	187	3,733
9	" " "	Midway tract	52		45 50		64,375	2,376	66,751
10	" " "	Missouri Central tract	25½		42 00		1,690	1,199	2,889
11	" " "	Porter tract	22		46 00		804	1,012	1,816
12	" " "	Richland tract	283½		46 00		16,399	13,041	29,440
13	Arkansas Mining Co	R. S. Morris	10		45 00		2,117	450	2,567
14	Bailey & Stickney	Bailey & Stickney,	2½		46 50		944	115	1,059
15	B. and C. Mining Co.	A. W. Oustott & Co.					15,002		15,002
16	Bankers' land	A. C. Brewington & Co.					96		96
17	Barbee & Yale	T. L. Yale	216½		45 50		2,847	10,850	13,697
18	Bay State Zinc Mining Co.	Bay State Zinc Mining Co.	271½		46 50		20,855	12,223	33,078
19	Beckwith Hall Mining Co.	Richmond Mining Co.	25		43 50		14,700	1,087	15,787
20	" "	Opal Wonder Mining Co.	100		44 00		4,000	4,400	8,400
21	Becky Sharp Mining Co.	Worked by scrappers	37		45 62		416	1,688	2,104
22	Bellville Land and Mining Co.	Bellville Land and Mining Co.					2,221		2,221
23	Big Bug Mining Co.	Theo. M. Nutz					350		350
24	Big Six Development Co.	W. D. & W. Mining Co.	1¾		46 20		3,936	80	4,016
25	" "	Fairview Mining Co.	11¼		44 00		55,258	495	55,753
26	Binghampton Zinc and Lead Mining Co.	Binghampton Zinc and Lead Mining Co.	33		45 00		1,311	1,485	2,796
27	Blue Wing Mining Co.	Blue Wing Mining Co., includes some work done by International	158		46 44		13,552	7,337	20,889
28	Boston Get There Mining Co.	Boston Get There Mining Co.	377½		45 68		42,952	17,230	60,182
29	" " "	Morton Mining Co.	14½		46 00		4,344	667	5,011
30	Boston Duenweg Mining Co.	Boston Duenweg Mining Co.	528		40 76		20,106	21,522	41,628
31	Boqua Mining Co.	Boqua Mining Co.	3		43 00		38,683	129	38,812

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
32	Bradford K. C. Lead & Mining Co.	Bradford K. C. Lead and Mining Co.	30½		$45 20		$5,684	$1,378	$7,062
33	Brinkley lease	Shayler & Morgan	2		45 50		950	91	1,041
34	Bunco Mining Co	W. P. Howard	111		46 00		9,702	5,106	14,808
35	Budweiser Mining Co.	H. M. Brewer	24		46 00			1,198	1,198
36	Burgner Mining Co.	Burgner Mining Co.	157		45 00		3,271	7.065	10,336
37	Center Creek Mining Co	Center Creek Mining Co	654		46 18		158,470	30,202	188,672
38	Colonial Zinc and Lead Mining Co.	Colonial Lead and Zinc Mining Co.					608		608
39	Colorado-Joplin M. & M. Co.	S. T. Nesbitt	48		50 00		4,812	2.375	7,187
40	Continental Zinc, Lead and Smelting Co.	Continental Zinc, Lead and Smelting Co.	156		46 00		182,640	7,176	189,816
41	Crown Crest Zinc and Lead Mining Co.	Crown Crest Zinc and Lead Mining Co.	520	124	44 60	$24 60	4,455	26,760	31,215
42	Davey & Son	Davey & Son	514		45 60		37,417	23,469	60,886
43	Della "S"	Ground & Patten					6,000		6,000
44	Dinkebeihler lease	J. J. Dinkebeihler	32		44 00		15,176	1,430	16,606
45	East Hollow Mining Co.	East Hollow Mining Co.					10,053		10,053
46	Eclipse Land & Mining Co.	Eclipse Lead and Mining Co.	41		48 00		1,508	1,958	3,466
47	" " "	F. M. Sponable, Hoo-Hoo	27		45 00		1,110	1,215	2,325
48	Eldorado Mining Co.	Eldorado Mining Co.	380		45 26		26,451	17,187	43,638
49	Eleventh Hour Mining Co.	Eleventh Hour Mining Co.	467		46 26		47,363	21,605	68,968
50	Empire Zinc Co.	Empire Zinc Co.	144		44 78		12,451	6.457	18,908
51	Estrada lease	Rafel Estrada					40,233		40.233
52	Freeman Land and Mining Co.	Freeman Land and Mining Co.					34,662		34,662
52½	Forrestal & O'Donnell	Geo. K. Hubbard	70		43 00		16,884	3,010	19,894
53	Funk & Bowman	Funk & Bowman	14		44 50		632	623	1,255
54	Gilchrist-Porter R. Co.	Zolo Mining Co.	192		44 00		15,574	8,426	24,000
55	Granby Mining and Smelting Co.	G. M. & S. Co. at Joplin	2,133		45 64		196,554	97,327	293,881
56	" " "	G. M. & S. Co. at Oronogo	451		46 20		323,792	20,847	344,639
57	Hagardon, R.	R. Hagardon	17		46 50		1,667	790	2,457
58	Harrison, J. W.	J. W. Harrison	8		46 50		460	384	844
59	Holden Bros.	Holden Bros.	1		45 52		8,473	45	8,518
60	Homestead Lead and Zinc Co.	Homestead Lead and Zinc Co.	197		46 50		50,752	9,137	59,889
61	Hudson Mining Co.	Hudson Mining Co.					26,130		26,130
62	Ihlseng Mining Co.	Ihlseng Mining Co.	115		45 18		29,372	5,195	34,567

63	I Know Mine	I Know Mine	50		45 00		1,145	2,666	3,811
64	Imperial Mining Co.	E. H. Shattuc	4		45 72		24,165	234	24,399
65	Independence Mining Co.	Independence Mining Co.					16,634		16,634
66	Indiana Mining Co.	W. H. Gross & Co.	1		46 00		299	46	345
67	Investors' Mining Co	Investors' Mining Co	105		44 00		11,794	2,420	14,214
68	Ishpeming Mining Co.	Ishpeming Shaft A					22,537		22,537
69	" "	" " B	8		44 50			359	359
70	" "	" " C	154		45 86		29,307	7,083	36,390
71	" "	" Frisco					7,176		7,176
71½	Joplin Prospecting Co.	Lessees	217		46 40		6,494	10,071	16,565
72	Jeanette Mining Co.	J. H. Dangerfield	38		45 50		6,786	1,729	8,515
73	John Jackson Mining Co	John Jackson Mining Co					42,191		42,191
74	" "	Jack Johnson Mining Co					14,049		14,049
75	Jim Jackson Mining Co.	Jim Jackson Mining Co					14,762		14,762
76	Katy "C" Mining Co	Katy "C" Mining Co	1¼		45 74		25,346	57	25,403
77	Lead Hill Mining Co., Joplin	Lead Hill Mining Co.	3		45 50		16,117	136	16,253
78	" " Carthage	" "	92	25	45 34	23 30	446	4,718	5,164
79	Leonard Mining and R. Co.	Leonard M. and R. Co.	636		46 00		68,359	29,256	97,615
80	Lincoln Mining Co.	Lincoln Mining Co.	100		46 00		66,516	4,600	71,116
81	Leckie Mining Co.	Leckie Mining Co.	41		45 50		1,404	1,865	3,269
82	Lucky Tom	Frank Stafford	150		45 50		27,000	6,825	33,825
83	McConnell Mining Co.	McConnell Mining Co.	38		44 32			1,678	1,678
84	Mallett & Freeman	Lessees	21		44 50		7,872	935	8,807
85	Mistletoe Mining Co	Mistletoe Mining Co.					69,015		69,015
86	McKinley Mining Co	McKinley Mining Co.	57		45 80		11,891	2,611	14,502
87	" "	Alda Mining Co. No. 2	22		45 40		42,332	976	43.308
88	" "	Maud B. Mining Co.	24		45 70		55,907	1,096	57,003
89	" "	Goodenough Mining Co.	17		45 50		4,469	782	5,251
90	" "	C. L. Ashcraft	1		47 00		2,017	47	2,094
91	" "	Dell "C." Mining Co.	38		46 10		7,663	1,767	9,430
92	" "	Old Lead Shaft	104		45 40			4,723	4,723
93	McMillan & Raymond	McMillan & Raymond					43,804		43,804
94	Manhattan Mining Co.	Manhattan Mining Co.	9		44 83		4,139	369	4,508
95	" "	Sullivan & Young	38		46 82			1,790	1,790
96	" "	Watson & Mehaffy	23		45 96			1,034	1,034
97	Massassolt Mining Co.	Massassolt Mining Co	604		45 70		24,304	27,602	51.906
98	Mignonette Mining Co.	Waddell & Co.					41,917		41,917
99	Missouri Lead and Zinc Co.	Sub-lessees	2,315	6	46 02	10 45	128,226	106,642	234,868
100	Missouri Zinc Fields Co.	Lessees	542		46 18		121,690	25,018	146,708
101	Mohaska Mining Co.	"	59		46 00		792	2,714	3,506
102	Montgomery Lead and Zinc Co.	"	¾		44 00		11,268	31	11,299
103	Mount Ararat Mining Co.	Mount Ararat Mining Co.	128		45 50		45,204	5,824	51,028
104	Neeley Mining Co.	Neeley Mining Co.					3,199		3,199
105	North Heights M. and M. Co.	North Heights M. and M. Co.	1¼		46 00		2,730	57	2.787
106	" "	D. K. Hartz	41½		45 60		6.961	1,883	8,844
107	North Joplin Mining Co.	W. H. Landreth & Henry C. M. Co.	6		45 50		610	273	883
108	Old Colony Zinc and Smelting Co.	L. W. Winter	71¾		45 82		55,920	3,251	59,171
109	Olympia Zinc Co.	Olympia Zinc Co.	4¼		45 00		1,656	191	1,847
110	Owensboro-Joplin Mining Co.	Owensboro-Joplin Mining Co.					7,243		7,243
111	Oxford Mining Co.	Oxford Mining Co.					4,188		4,188
112	" "	Hazel Mining Co.					201		201
113	" "	Pee Wee Mining Co.					772		772

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
114	Oxford Mining Co.	Long String Mining Co.					$103		$103
115	" "	Cheap Screw Mining Co.					3,917		3,917
116	" "	Mastadon & Pecan Mining Co.					2,803		2,803
117	" "	Gold Shield Mining Co.	9¼		$46 00		16,728	$448	17,176
118	" "	D. Shaft					29,267		29,267
119	" "	Desplaines Mining Co.					54,836		54,836
120	" "	Little Giant Mining Co.					12,134		12,134
121	Parker and Johnson	Johnson, Willett & Co.	7½		44 00		7,606	330	7,936
122	Perkins Zinc Co.	Perkins Zinc Co.					14,010		14,010
123	Perry Leases Mining Co.	Sub-lessees	917½		49 31		64,920	45,423	110,343
124	Phelps & Connor	C. B. Lane	2		45 24		764	90	854
125	Pleasant Valley Mining Co.	Pleasant Valley Mining Co.					15,600		15,600
126	Plutocrat Mining Co.	Plutocrat Mining Co.	8		46 00		2,670	368	3,038
127	Plymouth Rock Mining Co.	Plymouth Rock Mining Co.					23,434		23,434
128	Porto Rico Mining Co.	W. J. Ground & Co.	741		47 00		39,322	34,109	73,431
129	Quaker Mining Co.	Holmes, Cope & Co.					24,000		24,000
130	Rabbit's Foot Zinc Mining Co.	Rabbit's Foot Zinc Mining Co.					30,000		30,000
131	Rannabarger Mining Co.	Lessees	3¼		46 00		143	150	293
132	Regan Land	Regan Land	8½		44 98		509	382	981
133	" "	Gate City Mining Co.	1		45 00		72	34	106
134	" "	M. J. McClurg et al.	2		46 82		4,089	93	4,182
135	Rex Mining Co.	Lessees	1,153	32	44 60	$24 94	20,023	52,247	72,270
136	Roaring Springs Mining Co.	Roaring Springs Land and Mining Co.	279		43 00		65,000	12,029	77,029
137	Roberta Mining Co.	Roberta Mining Co.	19		45 60		8,255	866	9,121
138	Sergent Mining Co.	Sergent Mining Co.					4.185		4,185
139	Sharpsburg Mining Co.	Sharpsburg Mining Co	213		47 10		11,288	10,032	21,320
140	Short Creek Mining Co.	Short Creek Mining Co.	27½	8	42 00	22 00	3,190	1,331	4,521
141	South Joplin Land Co.	New York Superior	60		46 50		9,020	2,790	11,810
142	South Joplin Mining Co.	Lessees	65		45 40		8,736	2,951	11,687
143	Spencer, C. H.	"					6,917		6,917
144	Sphinx Mining Co.	Sphinx Mining Co. and Lessees	18		47 00		53,378	846	54,224
145	Springer & Page	Springer & Page	8		46 00		8,812	368	9,180

146	Stuckey Mining Co	Stuckey Mining Co	5		46 00		3,750	230	3,980
147	Sultana Mining Co.	Sultana Mining Co.					34,878		34,878
148	Ten O'Clock Mining Co.	B. O. Ayler	810		46 92		265	38,005	38,270
149	Triad Mining Co.	Triad Mining Co.					3,276		3,276
150	Troup Mining Co.	Troup Mining Co.	273		46 00		47,844	12,558	60,404
151	United Zinc Companies	Cock Robin Mining Co	100		46 00		7,000	4,600	11,600
152	" " "	Bob Ingersoll Mining Co.	108		46 00		26,418	4,955	31,373
153	" " "	King Jack Mining Co.	142		45 00		64,955	6,378	71,333
154	" " "	Lackawana Mining Co.	333		46 44		64,562	15,453	80,015
155	" " "	Gibson Girl Mining Co	14		46 00		1,912	614	2,556
156	" " "	W. Armington Mining Co.							
157	" " "	Conqueror Mining Co.	65		46 00		44,361	2,995	47,356
158	" " "	Pelican Mining Co.	102		46 50		58,336	4,777	63,113
159	" " "	Deep Rock Mining Co.	6		46 50		10,644	290	10,934
160	" " "	Ft. Wayne Mining Co	4		46 50		10,393	197	10,590
161	" " "	Moonshine Mining Co.	53¼		46 40		672	2,482	3,154
162	Venture Mining Co.	Venture Mining Co.	6		44 00		20,202	264	20,466
163	Warren Lead and Zinc Co.	Warren Lead and Zinc Co					4,000		4,000
164	West Hollow Mining Co.	Lewellyn Bros.	30		45 00		5,054	1,361	6,415
165	West Joplin Lead and Zinc Co.	Portland Mine and Foster & Gray	3		45 00		12,650	135	12,785
166	Weyman & McConey	Weyman & McConey					3,793		3,793
167	Witch Hazel Mining Co.	Moore & Co.	4		45 18		495	187	682
168	Woodward Mine.	G. O. Ashcraft.		123		28 00	22,000	3,451	25,451
169	Wright Mining Co.	F. L. Yale	9		48 00		16,573	439	17,012
170	Yale & O'Brien	Yale & O'Brien	140		45 18		5,935	6,332	12,267
171	Product mines worked part year now defunct		539		45 47		119,412	24,508	143,920
172	Product Sludge Mills not otherwise reported		116		45 17		97,481	5,199	102,680
			23,664	318	$45 43		$4,371,282	$1,089,571	$5,460,853

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. Horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Aida Mining Co. No. 1	Aida Mining Co. No. 1	10	8	260	....	....	$2 25	1	....	1	1	....	2	....	1	2	....
2	Ajax Lead and Zinc Mining Co	Ajax Lead and Zinc Mining Co	31	10	180	....	....	2 00	....	1	1	2	....	2	2	1	1	4
3	Ashcraft-Reynolds Mining Co	Not being operated	....	....	....	....	....	....	....	....	2	1	....	1	1	1	2	....
4	American Z., L. and Smelting Co.	Center Valley tract	150	25	300	250	20	2 00	7	5	20	7	4	15	12	7	16	10
5	" " "	Cornfield tract	210	50	250	....	....	2 00	10	2	16	2	8	11	1	10	20	7
6	" " "	Davey tract	71	24	300	100	10	2 00	2	....	8	3	3	4	1	2	9	2
7	" " "	Interurban tract	10	5	100	100	10	1 75	....	....	4	2	....	4	3	....	....	....
8	" " "	Lone Lady tract	10	6	90	80	10	1 75	1	....	3	4	....	2	4	1	2	....
9	" " "	Midway tract	40	15	200	200	14	2 00	2	4	5	4	....	5	6	2	4	10
10	" " "	Missouri Central tract	10	2	90	150	10	2 00	....	2	....	....	....	1	5	....	..	4
11	" " "	Porter tract	7	4	105	150	8	2 00	....	....	....	....	....	10	....	....	....	....
12	" " "	Richland tract	30	10	150	150	10	1 75	2	2	4	1	2	3	2	2	4	4
13	Arkansas Mining Co	R. S. Morris	5	3	77	60	8	2 00	1	....	2	1	....	1	....	1	1	....
14	Bailey & Stickney	Bailey & Stickney	5	2	45	80	70	2 00	....	2	4	4	....	5	6	....	....	8
15	B. and C. Mining Co	A. W. Oustott & Co	12	5	140	120	....	1 75	1	....	3	1	1	1	....	1	2	....
16	Bankers' land	A. C. Brewington & Co	3	....	7	120	....	2 00	....	....	....	....	....	....	1	....	....	....
17	Barbee & Yale	T. L. Yale	18	2	100	200	....	2 00	1	1	3	4	....	3	1	2	2	5
18	Bay State Zinc Mining Co	Bay State Zinc Mining Co	25	13	100	225	....	2 25	2	2	5	3	....	4	....	1	2	....
19	Beckwith-Hall Mining Co	Richmond Mining Co.	12	8	200	100	....	2 00	1	....	1	1	1	1	....	1	1	....
20	" "	Opal Wonder Mining Co	10	6	250	....	....	2 00	1	....	2	....	2	1	....	1	1	....
21	Beckey Sharp Mining Co	Worked by scrappers	....	4	200	....	....	....	....	....	....	....	....	....	....	....	....	2
22	Bellville Land and Mining Co	Bellville Land and Mining Co.	4	2	120	....	2	2 00	....	....	1	2	1	....	....	....	....	1
23	Big Bug Mining Co	Theo. M. Nutz	2	1	60	120	2	2 00	....	....	1	....	....	....	1	....	....	1
24	Big Six Development Co	W. D. & W. Mining Co	6	2	110	100	6	2 00	...	....	3	....	....	....	1	....	....	3
25	" "	Fairview Mining Co	14	10	200	....	....	2 00	1	....	2	....	....	2	1	2	1	...
26	Binghampton Z and L. Mining Co.	Binghampton Z. and L. Mining Co	4	2	90	150	4	2 00	....	1	1	1	....	....	....	....	....	2
27	Blue Wing Mining Co	Blue Wing Mining Co. includes some work done by International	24	10	110	....	....	2 00	2	4	2	4	1	3	....	2	4	4
28	Boston Get There Mining Co	Boston Get There Mining Co	30	16	300	....	....	2 00	3	....	4	3	3	3	...	3	3	....
29	" " "	Morton Mining Co	10	5	100	20	....	2 00	1	....	1	1	1	1	....	1	2	....
30	Boston Duenweg Mining Co	Boston Duenweg Mining Co.	22	8	160	60	10	2 00	5	1	10	4	5	6	..	4	5	3
31	Boqua Mining Co	Boqua Mining Co	16	10	200	165	10	2 00	2	3	6	4	1	5	....	4	6	4

32	Bradford K. C. L. and Mining Co.	Bradford K. C. Lead and Mining Co.	12	10	98			2 00	1		2	2		1		1	2	
33	Brinkley lease	Shayler & Morgan	3	3	90			2 00		2	1			1				2
34	Bunco Mining Co	W. P. Howard	16	6	120	103	3	1 75		2	2			3	1			10
35	Budweiser Mining Co.	H. M. Brewer	6	2	35			2 00		1	1	1		1				3
36	Burgner Mining Co	Burgner Mining Co.	4	2	175			2 00	2	3	2	2		3	3	2	4	3
37	Center Creek Mining Co.	Center Creek Mining Co.	120	35	260	220	20	2 00	12	2	20	5	2	16	6	13	12	2
38	Colonial Z. and L. Mining Co.	Colonial Lead and Zinc Mining Co.	10	5	100	150		2 00	1		3	2		2		1	2	
39	Colorado-Joplin M. & M. Co.	S. T. Nesbitt	28	4	100	80	10	2 00		7	4	2		4	2			14
40	Continental Z., L. and Smelting Co.	Continental Z., L. and Smelting Co.	120	30	250		1	2 00	9	5	18	6		18	3	12	18	15
41	Crown Crest Z. and L. Mining Co.	Crown Crest Z. and L. Mining Co.	25	15	260	260		2 00	2	8	6	4		4	5	2	2	8
42	Davey & Son	Davey & Son	62	51	240	125	9	1 75	4	4	10	6		7	4	6	12	7
43	Della "S"	Ground & Patten	5	5	125			2 00			2	1		1				
44	Dinkebeihler lease	J. J. Dinkebeihler	15	2	300	300		2 00		3	3	3		2	3			7
45	East Hollow Mining Co.	East Hollow Mining Co.	12	5	240	200	13	2 00	1		5	5		5	3	1	2	5
46	Eclipse Land and Mining Co.	Eclipse Lead and Mining Co.	15	10	20	300	16	2 00	1	1	10	6		8	2	1	2	4
47	" " "	F. M. Sponable, Hoo-Hoo	6	2	30	30		2 00	1		1	2		1		1	2	
48	Eldorado Mining Co.	Eldorado Mining Co.	26	18	200			2 00	3	4	6	3	1	4	2	3	6	6
49	Eleventh Hour Mining Co.	Eleventh Hour Mining Co.	75	2	200	100	6	2 00	6		12	1		9		6	12	
50	Empire Zinc Co	Empire Zinc Co	15	5	220	160	22	2 00	1	2	14	14			15	2	2	4
51	Estrada lease	Rafel Estrada	30	18	230	80	10	2 25	2		4	3		2		2	6	
52	Freeman Land and Mining Co.	Freeman Land and Mining Co.	14	6	232			2 25	1		1	2		1		1	2	
52½	Forrestal & O'Donnell	Geo. K. Hubbard	15	10	180			2 00	2		3	2		4		2	4	
53	Funk & Bowman	Funk & Bowman	3	2	100			2 00			2				1			2
54	Gilchrist-Porter R. Co.	Zolo Mining Co	15	5	170		6	00	1	3	3	2		3	2	1	2	5
55	Granby Mining and Smelting Co.	G. M. & S. Co. at Joplin.	207	25	145			25	10	15	25	20	15	25	6	13	22	25
56	" " "	G. M. & S. Co. at Oronogo	250	75	300		10	1 75	15	1	33	21	3	22	1	15	15	1
57	Hargardon, R.	R. Hargardon	8	5	40			2 00	1	4	4	2		1	3	1	1	8
58	Harrison, J. W.	J. W. Harrison.	4	2	21			2 00		1	1			1				3
59	Holden Bros.	Holden Bros.	10	4	130	110	4	91	1	5	4	4		1	2	1	2	15
60	Homestead Lead & Zinc Co.	Homestead Lead & Zinc Co	15	12	172	300	10	2 00	2		5	1	2	3		1	2	
61	Hudson Mining Co.	Hudson Mining Co	15	13	90	100		2 25	1		2	1	1	1		1	3	
62	Ihlseng Mining Co.	Ihlseng Mining Co	30	11	300		8	92	2	4	5	4		4	4	2	4	10
63	I Know Mine.	I Know Mine.	5	2	105			2 00	1	1	2	1					2	1
64	Imperial Mining Co.	E. H. Shattuc.	15	5	200			25	1		2	1		1		1	2	
65	Independence Mining Co.	Independence Mining Co	15		150			1 90	1		2	2		2		1	2	
66	Indiana Mining Co.	W. H. Gross & Co.	3	2	24	240	6	2 00		1	1			1				2
67	Investors' Mining Co	Investors' Mining Co.	12	9	168	18		2 00	1		2	1		2	1	1	2	
68	Ishpeming Mining Co.	Ishpeming Shaft A.	25	10	130			2 00	1		2	3		1				
69	" "	" " B.	6	2	30			2 00						1				
70	" "	" " C.	14	5	120	40		2 00	1		2	1		2		1	2	
71	" "	" Frisco.	10	6	120		2	2 00	1		2	2	1	1		1	2	
71½	Joplin Prospecting Co.	Lessees	12	4	120			2 00			4	2		3	2	2		
72	Jeanette Mining Co.	J. H. Dangerfield.	10	3	124			2 00		1	1	1		1	3			5
73	John Jackson Mining Co.	John Jackson Mining Co.	10	8	200			00	2		4	2	1	2		2	4	
74	" "	Jack Johnson Mining Co.	5	5	200	150		2 00	1		2	1		1		1	2	
75	Jim Jackson Mining Co.	Jim Jackson Mining Co.	4	2	250	100		2 00	1			1		1				
76	Katy "C" Mining Co	Katy "C" Mining Co	10	7	230	40		2 00	1		1			1		1	2	
77	Lead Hill Mining Co., Joplin	Lead Hill Mining Co.	9	5	160			2 00		2	2	4		3	3	1	1	4
78	Lead Hill Mining Co., Carthage.	Lead Hill Mining Co.	4	2	90			1 75			1	1			4			
79	Leonard Mining & R. Co.	Leonard Mining and R. Co.	60	22	165			2 00	4	4	17	15	2	12	3	9	11	9
80	Lincoln Mining Co.	Lincoln Mining Co	20	5	240	120	2	1 80	1		2	2		3		1	4	
81	Leckie Mining Co.	Leckie Mining Co.	6	2	72	220	8	2 00			4				2			2
82	Lucky Tom	Frank Stafford	13	8	210	90	3	2 00	1		2	1		1		1	2	
83	McConnell Mining Co.	McConnell Mining Co	4		30					1								1

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
84	Mallett & Freeman	Lessees	10	5	106	110	5	$2 00	1	1	2	3	....	1	1	1	2	2
85	Mistletoe Mining Co.	Mistletoe Mining Co.	20	6	250	....	......	2 00	1	....	1	1	....	2	....	1	2	....
86	McKinley Mining Co.	McKinley Mining Co.	18	6	125	75	......	2 00	5	2	2	1	....	1	....	2	2	....
87	" "	Aida Mining Co. No. 2	15	5	290	36	......	2 00	1	....	4	....	....	1	....	1	2	....
88	" "	Maud B. Mining Co.	12	6	200	....	......	2 00	1	....	1	....	....	1	....	1	2	....
89	" "	Goodenough Mining Co.	12	2	75	35	......	2 00	1	....	1	....	....	1	....	1	2	...
90	" "	C. L Ashcraft	5	2	100	20	......	2 00	....	1	1	....	....	1	....	....	....	3
91	" "	Dell "C" Mining Co.	5	5	163	86	......	2 00	1	....	1	....	....	1	....	1	1	1
92	" "	Old Lead Shaft	3	3	190	5	......	2 00	....	1	....	....	....	....	1	....	....	2
93	McMillan & Raymond	McMillan & Raymond	35	17	130	....	......	2 00	3	....	7	5	....	4	....	3	6	....
94	Manhattan Mining Co.	Manhattan Mining Co.	10	8	90	....	......	2 25	1	....	2	2	1	2	2	2	2	2
95	" "	Sullivan & Young	2	....	100	....	......	2 00	...	1	....	....	....	....	....	1	....	1
96	" "	Watson & Mehaffy	2	....	92	....	......	2 00	....	1	....	....	....	....	....	1	....	1
97	Massassoit Mining Co.	Massassoit Mining Co.	14	9	200	7	......	2 00	1	3	2	3	....	1	4	6	1	1
98	Mignonette Mining Co.	Waddell & Co.	14	8	222	15	......	1 95	1	....	2	2	....	....	1	....	1	2
99	Missouri Lead & Zinc Co.	Sub-lessees	191	38	289	....	......	2 00	34	19	6	....	....	....	31	27	9	18
100	Missouri Zinc Fields Co.	Lessees	135	80	300	300	20	2 00	10	8	18	3	....	2	15	12	10	20
101	Mohaska Mining Co.	"	7	3	120	....	......	2 00	....	....	1	2	....	..	1	1	....	....
102	Montgomery Lead and Zinc Co.	"	9	2	150	....	2	2 00	1	1	2	1	....	....	1	2	1	4
103	Mount Ararat Mining Co.	Mount Ararat Mining Co.	15	8	200	100	......	2 00	2	2	2	1	...	3	...	2	2	6
104	Neeley Mining Co.	Neeley Mining Co.	10	5	100	....	......	2 00	1	....	3	3	....	3	....	1	1	...
105	North Heights M. and M. Co.	North Heights M. & M. Co.	4	....	90	....	......	2 00	1	....	1	1	....	2	....	1	2	....
106	" "	D. K. Hartz	10	1	150	....	......	2 00	1	2	2	1	....	3	1	1	1	5
107	North Joplin Mining Co.	W. H. Landreth & Henry C. M. Co.	3	2	80	200	......	2 00	....	....	....	....	....	....	2	....	....	....
108	Old Colony Zinc and Smelting Co.	L. W. Winter	60	25	220	....	......	2 00	3	....	12	6	1	8	....	3	6	....
109	Olympia Zinc Co.	Olympia Zinc Co.	14	6	35	....	....	2 00	1	....	2	1	....	3	....	1	1	....
110	Owensboro-Joplin Mining Co.	Owensboro-Joplin Mining Co.	10	4	130	....	......	2 00	....	2	2	1	....	1	....	....	....	2
111	Oxford Mining Co.	Oxford Mining Co.	10	15	60	....	......	2 00	1	5	5	6	....	2	....	1	2	10
112	" "	Hazel Mining Co.	4	2	10	100	......	2 00	....	1	1	1	....	1	....	....	....	3
113	" "	Pee Wee Mining Co.	4	4	30	60	......	2 00	....	1	1	....	....	1	....	....	....	2
114	" "	Long String Mining Co.	2	2	10	75	......	2 00	....	1	1	1	....	1	....	....	....	2
115	" "	Cheap Screw Mining Co.	5	4	75	50	......	2 00	....	1	1	1	....	1	....	....	...	3

116	" "	Mastadon & Pecan Mining Co.	6	6	15	100		2 00	1		2	1		2		1	2	
117	" "	Gold Shield Mining Co.	8	6	100	50	3	2 00		1	1	1		2				5
118	" "	D. Shaft.	17	7	75	100		2 00	1		1		1	1		1	2	
119	" "	Desplaines Mining Co.	20	15	225			2 00	1	1	2	1		1		1	2	5
120	" "	Little Giant Mining Co	6	6	150	75		2 00		1	1			1				3
121	Parker & Johnson.	Johnson, Willett & Co.	15	5	144			1 95	1		2			2				
122	Perkins Zinc Co	Perkins Zinc Co.	20	10	170	100		2 00	1	3	3	3		3	1	2	2	6
123	Berry Lease Mining Co.	Sub-lessees Mining Co	90	35	250	60	100	2 00	2	12	6	3			11	3	4	30
124	Phelps & Connor.	C. B. Lane.	2	2	50	60	2	2 00	1	1	1		1				2	2
125	Pleasant Valley Mining Co.	Pleasant Valley Mining Co	10	5	240			1 75	1		3	2		2		1	1	
126	Plutocrat Mining Co	Plutocrat Mining Co.	3	2	67			2 00	1		3	3		2		2	1	
127	Plymouth Rock Mining Co.	Plymouth Rock Mining Co.	15	5	160			2 00	1	1	3	1		3	1	1	2	4
128	Porto Rico Mining Co.	W. J. Ground & Co.	26	12	227	122	7	2 00	4	3	9	3		8	6	4	8	7
129	Quaker Mining Co.	Holmes, Cope & Co.	24	11	130		2	2 05	1		3	1	1	1		1	2	
130	Rabbit's Foot Zinc Mining Co	Rabbit's Foot Zinc Mining Co.	10	7	276			2 00	1		2	1		1		1	3	
131	Rannabarger Mining Co	Lessees	5	2	90	300	6	1 75			6	3		5				
132	Regan Land	Regan Land.	7	3	100	100	4	2 00		3					4			3
133	" "	Gate City Mining Co.	3	2	20	40		2 00										
134	" "	M. J. McClurg et al.	7	4	90	180	1	2 00	1		1	1		1		1	2	
135	Rex Mining Co.	Lessees	60	15	220	240	7	2 00	1	6	6	3		3	12	1	2	9
136	Roaring Springs Mining Co	Roaring Springs Land and Min'g Co	54	40	280	200	15	2 00	2	1	8	6		10	6	2	5	8
137	Roberta Mining Co.	Roberta Mining Co.	7	5	236	60	2	2 00	1		2	1		1		1	2	
138	Sergent Mining Co	Sergent Mining Co	3	2	220			2 00		1	1	1						4
139	Sharpsburg Mining Co.	Sharpsburg Mining Co.	18	8	240			2 25	1		2	1	1	1		1	2	
140	Short Creek Mining Co.	Short Creek Mining Co.	10	5	200	100	5	2 00		2					2			8
141	South Joplin Lead Co	New York Superior.	12	8	200	100	2	1 75	1	7					8			12
142	South Joplin Mining Co.	Lessees	10	9	220	100	2	2 00		2					2			4
143	Spencer, C. H.	" "	8	5	210			2 00										
144	Sphinx Mining Co	Sphinx Mining Co. and Lessees	25	10	280	100	10	2 16	1		2	1		2		1	2	
145	Springer & Page.	Springer & Page	7	4	120			2 00										
146	Stuckey Mining Co	Stuckey Mining Co.	8	15	60	140	15	2 00	1	2	4	5		3	4	1	2	5
147	Sultana Mining Co.	Sultana Mining Co	20	6	180	145		2 00	1		1	2		1		1	2	
148	Ten O'Clock Mining Co.	R. C. Ayler	17	4	200	75	2	2 00	1	1	2	1		2		1	1	5
149	Triad Mining Co.	Triad Mining Co	8	4	90			2 00		10	3	3		3				10
150	Troup Mining Co	Troup Mining Co.	30	15	260	200	6	2 00	3	1	7	2	2	5	2	4	6	2
151	United Zinc Companies.	Cock Robin Mining Co.	10	8	150	150		2 00	1		3	3		3		1	2	2
152	" " "	Bob Ingersoll Mining Co	10	9	200	100		2 30	1		1	1	1	1		2	4	
153	" " "	King Jack Mining Co.	25	20	275	200		2 25	1		3	3		3	1	1	2	
154	" " "	Lackawanna Mining Co.	16	11	210			2 15	1		3	4	1	2		1	3	
155	" " "	Gibson Girl Mining Co.	4	6	30	150		2 25	1		1	1		1		1	2	
156	" " "	W. Armington Mining Co	6	2		120		2 00			1	1		1				
157	" " "	Conquerer Mining Co.	14	10	290			2 25	1		2	3		3		1	2	
158	" " "	Pelican Mining Co.	18	17	320	40		2 00	1		3	4		3		1	3	
159	" " "	Deep Rock Mining Co	20	13	60	90	6	2 00	1		3	1		1		1	2	
160	" " "	Ft. Wayne Mining Co	6	4	120	240		2 25	1		2	1	1	1		1	3	
161	" " "	Moonshine Mining Co.	2	1	110			1 75		2	1	1		1		2		2
162	Venture Mining Co.	Venture Mining Co.	12	12	200	100		2 00	1		3	2		2		1	5	
163	Warren Lead & Zinc Co.	Warren Lead and Zinc Co.	4		30	200		2 00	1		2			1		1	2	
164	West Hollow Mining Co.	Lewellyn Bros.	8	3	120			2 00		5	3	3		2	3	1		4
165	West Joplin Lead & Zinc Co.	Portland Min'g and Foster & Gray	3	2	100			2 00		1								2
166	Weyman & McConey	Weyman & McConey	10	5	30	90		2 00	2		2	2		2		2	2	
167	Witch Hazel Mining Co.	Moore & Co	4		50	12		2 00		1					1			2
168	Woodward Mine.	G. O. Ashcraft.	22	10	240	100	2	2 00	1		1		1	1		1	1	
169	Wright Mining Co.	F. L. Yale.	10	1	250	300	8	2 00	2		2	2		2		1	1	

EMLPOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JASPER COUNTY.

Office number.	Mine owner or company.	Operator.	Employes.		No. days worked producing ore.	No. days' development work.	No. of men prospecting.	Wages paid.	Machinery employed.									
			Miners.	Other help.					Concen'ing plants.	No. hand jig plants.	No. boilers.	No. steam pumps.	No. air compressors.	No. steam hoisters.	No. horse hoisters.	No. crushers.	No. steam jigs.	No. hand jigs.
170	Yale & O'Brien	Yale & O'Brien	8	1	240	300	5	$2 00	....	2	3	1	....	3	....	2	1	5
171	Product of mines worked part of year, now defunct		106	52	109	....	......	2 15	5	17	14	12	....	8	14	7	22	31
172	Product of Sludge Mills not otherwise reported		....	81	127	....	......	1 75	....	....	....	....	....	....	....	..	34	18
			3,840	1,633	26,418	12,549	612	......	270	257	607	368	73	447	272	297	473	545

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

BARRY COUNTY.

Office number.	Mine owner or company.	Operator.	Acres of land leased or owned.	Amount of capital.	No. of shafts operated.	Average depth of shafts.	Tons of zinc ores. Zinc.	Tons of zinc ores. Silicate.	Price received for Zinc.	Price received for Silicate.
1	Marlott & Berry	Marlott & Kelley	40	$800	5	55	....	100	....	$10 00
2	Pioneer Mining & M. Co.	Pioneer M. & M. Co.	40	1,000	1	40	5	11	$20 00	10 00
			80	$1,800	6	53	5	111	$20 00	$10 00

BARRY COUNTY.

Office number.	Mine owner or company.	Operator.	Tons of lead ores. Lead.	Tons of lead ores. Dry-bone.	Prices received for Lead.	Prices received for Dry-bone.	Receipts from Zinc.	Receipts from Lead.	Total amount received for both lead and zinc.
1	Marrlott & Berry	Marlott & Kelley	....	...	......	......	$1,000	....	$1,000
2	Pioneer Mining & M. Co.	Pioneer M. & M. Co.	....	...	......	......	210	....	210
			....	...	......	......	$1,210	....	$1,210

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

BARRY COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No days worked producing ore	No. days development work	No. of men prespecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Marlott & Berry	Marlott & Kelley	6	4	70	180	.....	$1 50	....	1	1	1	.	1	2	1	....	4
2	Pioneer Mining & M. Co.	Pioneer M. & M. Co.	5	4	40	160	......	1 50	1	....	2	....	....	1	....	1	2	....
			11	8	110	340		$1 50	1	1	3	1	....	2	2	2	2	4

BENTON COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Americus Z., L. M. & M. Co.	Americus Z., L. M. & M. Co.	80	$20,000	1	100	200	....	$20 00	....
2	The Rockwell Mining Co.	The Rockwell Mining Co.	6	7,000	1	150	20	....	20 00	....
3	Furnished smelters	By small operators	....	....	....	......	20	......	20 00	... .
			86	$27,000	2	125	240	....	$20 00	....

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

BENTON COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores. Lead	Tons of lead ores. Dry-bone	Price received for Lead	Price received for Dry-bone	Receipts from Zinc	Receipts from Lead	Total amount received for both lead and zinc
1	Americus Z., L. M. & M. Co.	Americus Z., L., M. & M. Co.	75	.	$46 50	......	$4,000	$3,487	$7,487
2	The Rockwell Mining Co.	The Rockwell Mining Co.	1	..	42 00	......	400	42	442
3	Furnished smelters	By small operators	30	..	42 00	......	400	1,260	1,660
			106	....	$45 18	....	$4,800	$4,789	$9,580

BENTON COUNTY.

Office number	Mine owner or company.	Operator.	Employes. Miners	Employes. Other help	No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed. Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No hand jigs
1	Americus Z., L. M. & M. Co.	Americus Z., L. M. & M. Co.	7	6	90	125	......	$1 75	1	....	2	1	1	1	...	1	2	....
2	The Rockwell Mining Co.	The Rockwell Mining Co.	6	5	60	175	......	1 50	1	1	2	2	....	1	1	1	....	4
3	Furnished smelters	By small operators	......	......	......	......	......	......	....	....	....	....	....	....	....	....	....	....
			13	1	150	300	......	$1 62	2	1	4	3	1	2	1	2	2	4

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

COLE COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores. Zinc	Tons of zinc ores. Silicate	Price received for Zinc	Price received for Silicate
1	Farmer Mine	J. A. McLaughlin	100	$2,000	1	75				
2	Independence Mine, Mrs. Marsteller	Mrs. J. W. Marsteller	45	800	2	18				
3	Furnished smelters	By farmers								
			145	$2,800	3	55				

COLE COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores. Lead	Tons of lead ores. Dry-bone	Price received for Lead	Price received for Dry-bone	Receipts from Zinc	Receipts from Lead	Total amount received for both lead and zinc

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

CÓLE COUNTY

Office number	Mine owner or company.	Operator.	Employes. Miners	Employes. Other help	No. days worked producing ore	No. days' development work	No. of men prospecting	Wages paid	Machinery employed. No. concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Farmer Mine	J. A. McLaughlin	4	1	16	120	......	$1 25	....	....	1	1	....	....	1	....	....	1
2	Independence Mine, Mrs. Marsteller	Mrs. J. W. Marsteller	2	1	70	20	2	1 50	....	1	....	....	....	....	....	....	....	1
3	Furnished smelters	By farmers	....	....	....	....	......	......	....	....	....	....	....	....	....	....	....	....
			6	3	86	140	2	......	....	1	1	1	...	....	1	....	....	2

CHRISTIAN COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shaft	Tons of zinc ores. Zinc	Tons of zinc ores. Silicate	Price received for Zinc	Price received for Silicate
1	Alma Mining Co.	Alma Mining Co.	10	$800	1	135	....	11	....	$17 00
2	Furnished smelters	Sundry small operators	....	....	....	.....	....	....	....	....
			10	$800	1	135	... .	11	... .	$17 00

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

CHRISTIAN COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Alma Mining Co.	Alma Mining Co.	32½	....	$44 00	.....	$187	$1,430	$1,617
2	Furnished smelters	Sundry small operators	148	....	43 50	......	....	6,438	6,438
			180½	....	$43 70	.....	$187	$7,868	$8,055

CHRISTIAN COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					No. concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Alma Mining Co.	Alma Mining Co.	4	2	25	25	......	$2 00	1	....	1	1	...	1	....	1	1	....
2	Furnished smelters	Sundry small operators	....	....	....	....	......	......	....	....	....	....	....	....	....	....	....	....
			4	2	25	25	......	$2 00	1	....	1	1	....	1	....	1	1	....

GREENE COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shaft	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	The Daisey Mining & M. Co.	The Daisy M. & M. Co.	85	$20,000	1	60	60		$23 00	
2	Duncan Mine	P. O. Rainey	4	2,000	1	120	12½	84	23 00	$13 00
3	Sundry small operators	Shipped to smelters					168	150	23 50	12 50
			89	$22,000	2	90	240½	234	$23 00	$12 75

GREENE COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	The Daisey Mining & M. Co.	The Daisey M. & M. Co.	10		$45 00		$1,380	$450	$1,830
2	Duncan Mine	P. O. Rainey	8		44 00		1,379	352	1,731
3	Sundry small operators	Shipped to smelters	90		42 00		5,823	3,780	9,603
			108		$42 43		$8,582	$4,582	$13,164

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

GREENE COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	The Daisey Mining & M. Co.	The Daisy M. & M. Co.	10	8	60	120	......	$1 75	1	1	2	2	....	1	....	1	1	2
2	Duncan Mine	P. O. Rainey	3	....	90	100	......	1 75	....	1	1	...	....	1	....	1	....	3
3	Sundry small operators	Shipped to smelters	....	....	....	....	......	......	....	....	....	....	....	....	....	....	....	....
			13	8	150	220	.....	$1 75	1	2	3	2	....	2	....	2	1	5

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

LAWRENCE COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Baptist Mining Co	Stacey & Co	3	....	1	100	....	60	....	$13 00
2	Boston Aurora Zinc Co	Boston Aurora Zinc Co	538	$10,000	2	200	782½	....	$22 91	....
3	" "	Myrtle, J	4	7,500	1	215	639	....	23 50	....
4	C. O. O. Mine	Stotts City Mining Co	15	4,000	1	210	278	....	24 52	....
5	Chicago-Aurora Zinc and Lead Mining Co	Edgar W. Pfau	15	....	6	100	....	900	....	13 33
6	" " "	Kemper & Co	5	15,000	3	110	200	....	25 06	....
7	Cleveland-Aurora Mineral Land Co	Cleveland-Aurora Mineral Land Co	169	500,000	14	101	874	756	19 75	11 90
8	Decatur Lead and Zinc Co	Decatur Lead and Zinc Co	40	10,000	2	130	466	1,138	24 15	14 60
9	Federal Zinc and Lead Co	Federal Zinc and Lead Co	20	....	2	60	303	....	23 85	....
10	Kentucky Mining Co	Kentucky Mining Co	20	....	4	147	433	127	24 00	12 00
11	L. L. Hyde	L. L. Hyde	18	40,000	1	180	153	....	26 00	....
12	Methodist Mine No. 1	C. H. Reynolds & Co	4	....	1	107	....	94½	....	12 87
13	Mt. Vernon Mining Co	Mt. Vernon Mining Co	237	125,000	4	200	1,015	....	25 76	....
14	Reil Huston Mining & S. Co	Reil Huston M. & S. Co	14	4,000	2	90	60	....	25 00	....
15	Seburn & Co	J. W. Seburn	4	....	1	110	....	....	....	....
16	Sphalerite Mining Co	Sphalerite Mining Co	7	20,000	2	110	450	....	22 00	....
17	Terre Haute Land and Mining Co	Terre Haute L. & M. Co	80	30,000	1	145	16	104	17 12	10 50
18	United Zinc Companies	United Zinc Companies	80	110,000	12	100	251	1,115	22 65	12 15
19	" "	Baby Ed. Mining Co	5	6,000	1	97	84¾	171	23 25	12 05
20	" "	Big Bob Mining Co	8	8,000	7	83	394	....	20 00	....
21	" "	Dewey Mining Co	5	10,000	3	110	836	....	24 84	....
22	" "	Expansion Mining Co	15	20,000	6	95	1,152	....	23 53	....
23	" "	National Mining Co	5½	10,000	3	110	....	1,096	....	14 57
24	" "	C. C. Plank	10	10,000	1	175	1,150	....	24 67	....
25	Wheeling & Aurora Mining Co	Wheeling & Aurora Mining Co	2	5,000	1	105	100	....	20 00	....
26	Companies working part of year and now out of business	....	....	....	....	....	1,700	890	23 00	13 50
			1,323	$914,500	82	102	11.339	6,451	24 08	13 50

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

LAWRENCE COUNTY.

Office number.	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc.
			Lead.	Dry-bone.	Lead.	Dry-bone.	Zinc.	Lead.	
1	Baptist Mining Co.	Stacey & Co.					$780		$780
2	Boston-Aurora Zinc Co.	Boston-Aurora Zinc Co.					17,926		17,926
3	" "	Myrtle, J.					15,001		15,001
4	C. C. C. Mine.	Stotts City Mining Co.	1		$45 50		6,817	$45	6,862
5	Chicago-Aurora Zinc and Lead Mining Co.	Edgar W. Pfau.					12,000		12,000
6	" " "	Kemper & Co.					5,000		5,000
7	Cleveland-Aurora Mineral Land Co.	Cleveland-Aurora Mineral Land Co.	70		41 00		26,058	2,948	29,006
8	Decatur Lead and Zinc Co.	Decatur Lead and Zinc Co.	88		44 00		27,867	3,872	31,739
9	Federal Zinc and Lead Co.	Federal Zinc and Lead Co.	41¾		45 12		7,126	1,882	9,008
10	Kentucky Mining Co.	Kentucky Mining Co.	20		45 70		11,917	914	12,831
11	L. L. Hyde.	L. L. Hyde.	38		44 00		3,978	1,596	5,574
12	Methodist Mine No. 1.	C. H. Reynolds & Co.	10		43 00		1,214	430	1,644
13	Mt. Vernon Mining Co.	Mt. Vernon Mining Co.	14¼		47 00		26,146	669	26,815
14	Reil Huston Mining & S. Co.	Reil Huston M. & S. Co.	2		45 50		1,500	91	1,591
15	Seburn & Co.	J. W. Seburn.	204		44 00			8,976	8,976
16	Sphalerite Mining Co.	Sphalerite Mining Co.	1½		44 00		9,900	66	9,966
17	Terre Haute Land and Mining Co.	Terre Haute L. & M. Co.					1,375		1,375
18	United Zinc Companies.	United Zinc Companies.	12½		44 50		19,232	556	19,788
19	" "	Baby Ed. Mining Co.					4,021		4,021
20	" "	Big Bob Mining Co.	61¼		45 12		7,870	2,773	10,643
21	" "	Dewey Mining Co.					20,766		20,766
22	" "	Expansion Mining Co.					27,094		27,094
23	" "	National Mining Co.	1		45 00		15,968	45	16,013
24	" "	O. C. Plank.					28,370		28,370
25	Wheeling & Aurora Mining Co.	Wheeling & Aurora Mining Co.					2,000		2,900
26	Companies working part of year and now out of business.		110		44 00		51,115	4,840	55,955
			675		$44 28		$351,041	$29,703	$380,744

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

LAWRENCE COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days' development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Baptist Mining Co.	Stacey & Co.	3					$1 75		1					1			3
2	Boston Aurora Zinc Co.	Boston-Aurora Zinc Co.	46	9	90	150	10	1 75	2		2	2			2	2	4	
3	" "	Myrtle, J.	10	7	90	150		1 75	1		1	1		1		1	2	
4	C. C. C. Mine	Stotts City Mining Co.	7	3	132			1 75	1		1	1		1		1	3	
5	Chicago-Aurora Z. and L. M. Co.	Edgar W. Pfau	28	15	150	30		1 75	1	4	3	3		3	2	1		15
6	" " " "	Kemper & Co.	8	5	40	160	2	1 75	1	1	3	2		2	2	1	1	2
7	Cleveland-Aurora Min'l Land Co.	Cleveland-Aurora Mineral Land Co	30	27	240	240	10	1 75	3	7	10	5		5	9	3	5	15
8	Decatur Lead and Zinc Co.	Decatur Lead and Zinc Co.	10	15	300		3	1 75	1	1	3	2	1	3		1	1	4
9	Federal Zinc & Lead Co.	Federal Zinc and Lead Co.	25	5	150			1 75	2		3	2		3		2	2	
10	Kentucky Mining Co.	Kentucky Mining Co.	30	25	225	200	10	1 75		4	4	2		4	3		1	4
11	L. L. Hyde	L. L. Hyde	12	6	162			1 75	1		2	1		1		1	1	
12	Methodist Mine No. 1	C. H. Reynolds & Co.	3	4	90			1 75		1					1			3
13	Mt. Vernon Mining Co.	Mt. Vernon Mining Co.	103	4	180	90	7	1 50	4		6	6		6		5	4	
14	Reil Huston Mining & S. Co.	Reil Huston M. & S. Co.	6	6	30	250		2 00	1		1	2		2		1	2	
15	Seburn & Co.	J. W. Seburn	4	4				1 75			1	1		1				4
16	Sphalerite Mining Co.	Sphalerite Mining Co.	3	2	150	300	5	1 75	2		3	1		3	1	2	3	
17	Terre Haute Land and M. Co.	Terre Haute L. & M. Co.	5	5	200			1 75	1	1	1	1		1		1	1	3
18	United Zinc Companies	United Zinc Companies	30	10	250			1 75		6	5	4		2	10			12
19	" "	Baby Ed. Mining Co.	8	4	100	100		1 75	1		2	1		2		1	2	
20	" "	Big Bob Mining Co.	10	5	210	90		2 00	1		1		1	2		1	2	
21	" "	Dewey Mining Co.	12	6	240	90		2 00	1		1	1		1		1	2	
22	" "	Expansion Mining Co.	18	10	200	60		2 00	1		2	1	1	3		1	3	
23	" "	National Mining Co.	7	6	250	90		1 75	1		1	2		2		1	2	
24	" "	C. C. Plank	16	9	225	60		1 85	1		1	1		2		1	2	
25	Wheeling & Aurora Mining Co.	Wheeling & Aurora Mining Co.	4	1		120		1 80			1	1						
26	Companies working part of year and now out of business																	
			432	193	3,704	2,180	47	$1 78	27	26	58	43	3	50	31	28	43	85

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MILLER COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ore. Zinc	Tons of zinc ore. Silicate	Price received for Zinc	Price received for Silicate
1	Gageville Mining Co	Gageville Mining Co.	160	$5,000	1	130				
2	Little Nugget Mining Co.	Little Nugget Mining Co.	111	600	1	135				
3	Furnished smelters.	By farmers.								
			271	$5,600	2	132				

MILLER COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores. Lead	Tons of lead ores. Dry-bone	Price received for Lead	Price received for Dry-bone	Receipts from Zinc	Receipts from Lead	Total amount received for both lead and zinc
1	Gageville Mining Co.	Gageville Mining Co.	25		$45 50			$1,137	$1,137
2	Little Nugget Mining Co.	Little Nugget Mining Co.	4½		44 00			198	198
3	Furnished smelters.	By farmers.	32		43 00			1,376	1,376
			61½		$44 28			$2,711	$2,711

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MILLER COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. Horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Gageville Mining Co.	Gageville Mining Co	2	10	90	120	......	$1 50	....	....	1	....	....	1	....	....	....	....
2	Little Nugget Mining Co.	Little Nugget Mining Co.	3	....	....	119	......	1 50	....	1	1	1	....	1	....	....	....	1
3	Furnished smelters.	By farmers.	....	....	....	....	......	....	....	....	....	....	....	....	....	....	....	....
			5	10	90	239	7	$1 50	....	1	2	1	....	2	....	....	....	1

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued

MONITEAU COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Fortuna Mining Co	Fortuna Mining Co	400	$25,000	1	125	231	....	$31 00	....
			400	$25,000	1	125	231	....	$31 00	....

MONITEAU COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Fortuna Mining Co	Fortuna Mining Co	548	....	$51 00	....	$7,161	$27,979	$35,140
			518	....	$51 00	....	$7,161	$27,979	$35,140

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued

MONITEAU COUNTY

Office number.	Mine owner or company.	Operator.	Employes.		No. days worked producing ore.	No. days development work.	No. of men prospecting.	Wages paid.	Machinery employed.									
			Miners.	Other help.					Concen'ing plants.	No. hand jig plants.	No. boilers.	No. steam pumps.	No. air compressors.	No. steam hoisters.	No. horse hoisters.	No. crushers.	No. steam jigs.	No. hand jigs.
1	Fortuna Mining Co.	Fortuna Mining Co.	6	5	126	258	10	$1 75	....	1	2	1	....	2	....	....	....	3
			6	5	126	258	10	$1 75	....	1	2	1	....	2	....	....	....	3

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MORGAN COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shaft	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Octavia Belle	Cohn & Redmon	240	$15,000	2	45	95	....	$26 25	....
2	Stucker Mine	Cohn & Redmon	160	4,000	2	90	10	....	26 50	....
3	Furnished smelters	By farmers	......	......	...	......	....	....	....	....
			400	$19,000	4	70	105	....	$26 25	....

MORGAN COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price rec'd for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Octavia Belle	Cohn & Redmon	5¾	....	$45 50	......	$2,493	$261	$2,754
2	Stucker Mine	Cohn & Redmon	18	....	45 50	......	265	819	1,084
3	Furnished smelters	By farmers	60	....	43 00	......	....	2,580	2,580
			83¾	....	$43 50	.....	$2,758	$3,660	$6,418

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MORGAN COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No days worked producing ore	No. days development work	No. of men prespecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Octavia Belle	Cohn & Redmon	4	2	90	110	20	$1 25	....	1	2	1	....	1	1	....	....	3
2	Stucker Mine	Cohn & Redmon	......	3	80	120	10	1 50	....	1	1	1	....	....	1	....	....	....
3	Furnshed smelters	By farmers	......	......	......	......	......	......	....	....	....	....	....	....	....	....	....	....
			4	5	170	230	30	$1 50	....	2	3	2	....	1	3	....	....	3

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued

NEWTON COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Alta Mining Co.	Alta Mining Co.	20	$300	2	70	....	22½	....	$12 00
2	Aunt Patty Mining Co.	H. H. Gregg	80	5,000	4	80	50	....	$22 00	....
				37,500						
3	Boston-Springfield Zinc Co.	Boston-Springfield Zinc Co., lessees	160	8,000	4	90	1,508	....	22 00	....
4	Cora, Jeannette Mining Co.	Cora, Jeannette Mining Co.	8	12,000	1	82	1,509	2½	22 00	11 00
5	Fox River Lead and Zinc Co.	Fox River Lead and Zinc Co.	40	7,000	1	80	....	273	....	18 50
6	Gobler Mine, Empire Zinc Co.	Empire Zinc Co.	160	200,000	1	100	1,209	420	25 00	12 11
7	Granby Mining and Smelting Co.	Granby Mining and Smelting Co.	9,000	....	43	40-200	7,459	5,877	23 00	20 00
8	Henrietta Mining Co.	Henrietta Mining Co.	160	....	4	80	....	13	....	12 00
9	Kansas City Mining and Milling Co.	Rains Bro. & Carpenter	40	50,000	2	140	1,077	....	20 50	....
10	Keystone Lead and Zinc Co.	Keystone Lead and Zinc Co.	40	....	1	155	....	1	....	8 50
11	Laughlin & Brown	Laughlin & Brown	80	15,000	1	80	23¾	....	22 00	....
12	Nemo Mining Co.	Nemo Mining Co.	120	....	2	100	147	25	24 00	10 00
13	Old Spurgeon-Easy Street & Knoxall	Lessees	240	60,000	5	70	3,000	20	22 00	11 00
14	St. Paul Mining Co.	St. Paul Mining Co	140	....	2	90	532	193	23 50	10 00
15	Saginaw Lead and Zinc Co.	Saginaw Lead and Zinc Co.	780	50,000	3	65	....	12⅜	....	10 00
16	Shoal Creek Mining Co.	Shoal Creek Mining Co.	40	2,500	4	65	31	3½	19 00	15 00
17	South Shoal Creek Mining Co.	Redding & Clark	40	1,000	2	90	....	....	....	....
18	Williams Land	Lessees	155	30,000	12	60	....	242½	....	13 00
19	Wyoming Mining and Milling Co.	Wyoming Mining and Milling Co.	17	17,554	2	82	220	48½	18 25	9 04
			11,320	$495,854	96	92	16,765	7,154	$22 65	$18 77

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

NEWTON COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Alta Mining Co.	Alta Mining Co.	3	275½	$46 50	$25 00	$270	$7,026	$7,296
2	Aunt Patty Mining Co.	H. H. Gregg	127½	25	49 00	28 00	1,100	6,948	8,048
3	Boston-Springfield Zinc Co.	Boston-Springfield Zinc Co., lessees	30	.....	45 00	.....	33,176	1,350	34,526
4	Cora, Jeanette Mining Co.	Cora, Jeannette Mining Co.	473	.....	44 50	.....	33,225	21,048	54,273
5	Fox River Lead and Zinc Co.	Fox River Lead and Zinc Co.	28	.....	46 00	.....	5,050	1,295	6,345
6	Gobler Mine, Empire Zinc Co.	Empire Zinc Co.	.....	.....	.....	.....	35,576	.....	35,576
7	Granby Mining and Smelting Co.	Granby Mining and Smelting Co.	974	95	50 00	20 00	289,097	50,615	339,712
8	Henrietta Mining Co.	Henrietta Mining Co.	5	7	44 00	22 00	153	374	527
9	Kansas City Mining and Milling Co.	Rains Bro. & Carpenter	20	2	45 50	25 00	22,078	975	23,053
10	Keystone Lead and Zinc Co.	Keystone Lead and Zinc Co.	2	.....	46 50	.....	8	93	101
11	Laughlin & Brown	Laughlin & Brown	2	.....	46 00	.....	522	92	614
12	Nemo Mining Co.	Nemo Mining Co.	16	5	46 00	23 50	3,778	854	4,632
13	Old Spurgeon-Easy Street & Knoxall	Lessees	750	50	44 50	26 00	66,220	34,025	100,245
14	St. Paul Mining Co.	St. Paul Mining Co.	507½	.....	46 00	.....	14,432	23,345	37,777
15	Saginaw Lead & Zinc Co.	Saginaw Lead & Zinc Co.	11	2	43 00	18 00	125	515	640
16	Shoal Creek Mining Co.	Shoal Creek Mining Co.	24	.....	46 00	.....	642	1,104	1,746
17	South Shoal Creek Mining Co.	Redding & Clark	6	42	46 00	26 00	.....	1,368	1,368
18	Williams Land	Lessees	523	.....	46 00	.....	3,153	24,046	27,199
19	Wyoming Mining and Milling Co.	Wyoming Mining and Milling Co.	.....	.....	.....	.....	4,457	.....	4,457
			3,502	503	$46 60	$23 13	$513,062	$175,073	$688,135

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued

NEWTON COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	Alta Mining Co.	Alta Mining Co.	2	2	....	....	3	$2 00	....	1	....	....	....	....	2	....	....	2
2	Aunt Patty Mining Co.	H. H. Gregg.	15	5	200	100	4	2 00	....	4	1	1	....	3	2	....	....	10
3	Boston-Springfield Zinc Co.	Boston-Springfield Zinc Co., lessees.	22	24	117	60	10	2 15	2	2	3	1	....	3	2	2	7	4
4	Cora, Jeannette Mining Co.	Cora, Jeannette Mining Co.	14	9	296	30	......	2 00	1	....	2	1	....	1	....	1	2	....
5	Fox River Lead and Zinc Co.	Fox River Lead and Zinc Co.	8	4	110	....	....	2 00	1	....	1	1	....	1	1	1	2	....
6	Gobler Mine, Empire Zinc Co.	Empire Zinc Co.	14	8	182	60	2	2 00	1	....	4	5	1	3	....	1	5	....
7	Granby Mining and Smelting Co.	Granby Mining and Smelting Co.	319	65	300	....	......	1 50	6	30	44	40	....	38	14	10	33	30
8	Henrietta Mining Co.	Henrietta Mining Co.	5	6	60	120	......	2 00	1	1	2	1	....	1	3	2	1	3
9	Kansas City Mining and Milling Co.	Rains Bro. & Carpenter.	10	8	223	90	......	2 00	1	....	2	....	....	1	1	1	3	2
10	Keystone Lead and Zinc Co.	Keystone Lead & Zinc Co.	2	2	6	220	......	2 00	...	1	...	....	....	....	....	....	....	2
11	Laughlin & Brown.	Laughlin & Brown.	2	2	.40	200	......	2 00	1	....	1	1	1	1	....	....	2	....
12	Nemo Mining Co.	Nemo Mining Co	12	8	110	200	3	2 00	....	2	1	....	....	1	3	....	....	4
13	Old Spurgeon-Easy St. & Knoxall.	Lessees.	80	20	210	50	12	2 00	3	4	8	5	....	10	7	....	7	18
14	St. Paul Mining Co.	St. Paul Mining Co.	20	10	195	127	8	2 00	1	1	3	2	....	2	1	1	4	2
15	Saginaw Lead and Zinc Co.	Saginaw Lead and Zinc Co.	6	4	4	6	6	1 75	....	1	....	....	....	....	2	....	....	5
16	Shoal Creek Mining Co.	Shoal Creek Mining Co.	8	2	180	160	10	2 15	....	1	2	1	....	2	3	1	....	6
17	South Shoal Creek Mining Co.	Redding & Clark.	2	1	150	....	......	2 00	....	1	....	....	....	....	1	....	....	2
18	Williams Land.	Lessees.	20	12	180	200	64	2 00	....	7	2	....	....	2	14	1	....	16
19	Wyoming Mining and Milling Co.	Wyoming Mining and Milling Co.	6	5	193	97	2	1 80	1	....	2	1	....	3	....	1	3	....
			567	196	2,756	1.720	124	......	19	56	78	60	2	72	56	22	69	106

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

ST. FRANCOIS COUNTY.

Office number.	Mine owner or company.	Operator.	Acres of land leased or owned.	Amount of capital.	No. of shafts operated.	Average depth of shafts.	Tons of zinc ores.		Price received for	
							Zinc.	Silicate.	Zinc.	Silicate.
1	Central Lead Co.	Central Lead Co.	1,604	$1,000,000	3	365				
2	Columbia Lead Co.	Columbia Lead Co.	943	900,000	2	400				
3	Doe Run Lead Co.	Doe Run Lead Co.	4,000	1,500,000	3	440				
4	Desloge Consolidated Lead Co.	Desloge Consolidated Lead Co.	3,640	1,000,000	2	325				
5	St. Joseph Lead Co.	St. Joseph Lead Co.	10,000	2,500,000	9	285				
6	St. Louis Smelting and Refining Co.	St. Louis Smelting and Refining Co.	1,250	1,000,000	2	402				
			21,437	$7,900,000	21	345				

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

ST. FRANCOIS COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Central Lead Co.	Central Lead Co.	9,221	....	$45 00	....	....	$414,930	$414,930
2	Columbia Lead Co.	Columbia Lead Co.	5,925	....	35 00	....	....	207,375	207,375
3	Doe Run Lead Co.	Doe Run Lead Co.	16,532	....	47 00	....	....	804,961	804,961
4	Desloge Consolidated Lead Co.	Desloge Consolidated Lead Co.	7,497	....	40 00	....	....	299,880	299,880
5	St. Joseph Lead Co.	St. Joseph Lead Co.	23,417	....	40 30	....	....	943,722	943,722
6	St. Louis Smelting and Refining Co.	St. Louis Smelting and Refining Co.	9,836	....	45 60	....	....	448,521	448,521
			72,428	....	$43 60	....	....	$3,119,389	$3,119,389

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

ST. FRANCOIS COUNTY.

Office number.	Mine owner or company.	Operator.	Employes.		No. days worked producing ore.	No. days development work.	No. of men prospecting.	Wages paid.	Machinery employed.									
			Miners.	Other help.					No. concen'ing plants	No. hand jig plants.	No. boilers.	No. steam pumps.	No. air compressors.	No. steam hoisters.	No. horse hoisters.	No. crushers.	No. steam jigs.	No. hand jigs.
1	Central Lead Co.	Central Lead Co.	100	200	293	....	4	$1 60	1	....	15	5	4	3	....	8	38	....
2	Columbia Lead Co.	Columbia Lead Co.	75	175	300	....	....	1 60	1	...	8	5	3	2	....	3	26	....
3	Doe Run Lead Co.	Doe Run Lead Co.	302	366	302	....	......	1 60	1	....	27	17	3	7	....	7	59	....
4	Desloge Consolidated Lead Co.	Desloge Consolidated Lead Co.	162	10	309	....	.. ..	1 65	1	....	10	5	3	3	....	7	60	....
5	St. Joseph Lead Co.	St. Joseph Lead Co.	634	46	300	....	......	1 76	1	....	24	28	7	9	....	10	110	....
6	St. Louis Smelting and Refining Co.	St. Louis Smelting and Refining Co.	80	320	300	....	......	1 65	1	....	5	*9	2	*2	....	14	166	....
			1,353	1,117	1,804	....	4	......	6	....	89	69	22	26	....	59	459	

*1 electric.

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MADISON COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned.	Amount of capital	No. of shafts operated	Average depth of shafts	Tons of zinc ores. Zinc	Tons of zinc ores. Silicate	Price received for Zinc	Price received for Silicate
1	Catherine Lead Co.	Catherine Lead Co.	1,540	$566,641	2	100 160				
2	Mine LaMotte	S. H. Leathe	38,000	800,000	4	160				
3	"	"								
			39,540	$1,366,641	6	150				

42 Tons Nickle and Cobalt @ $142.00.

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

MADISON COUNTY.

Office number.	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc.
			Lead.	Dry-bone.	Lead.	Dry-bone.	Zinc.	Lead.	
1	Catherine Lead Co.	Catherine Lead Co.	900	....	$40 00	.....	....	$36,000	$36,000
2	Mine LaMotte	S. H. Leathe	2,600	....	57 32	.....	....	149,036	149,036
3	"	"	....	....	.....	.....	....	5,964	5,964
			3,500	....	$52 80	.....	....	$191,000	$191,000

MADISON COUNTY.

Office number.	Mine owner or company.	Operator.	Employes.		No. days worked producing ore.	No. days development work.	No. of men prospecting.	Wages paid.	Machinery employed.									
			Miners.	Other help.					Concen'ing plants.	No. hand jig plants.	No. boilers.	No. steam pumps.	No. air compressors.	No. steam hoisters.	No. horse hoisters.	No. crushers.	No. steam jigs.	No hand jigs.
1	Catherine Lead Co.	Catherine Lead Co.	88	60	163	145	......	$1 50	1	....	3	3	....	2	....	2	14	....
2	Mine LaMotte	S. H. Leathe	130	90	300	....	......	1 40	1	....	10	14	....	1	....	1	12	....
3	"	"	....	....	....	....	......	......	....	....	....	....	....	5	....	....	....	....
			218	150	463	145	......	$1 50	2	....	13	17	....	8	....	3	26	

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JEFFERSON COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shaft	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	Valle Mining Co.	Valle Mining Co.	5,000	$200,000	25	100		1,561		$12 75
2	Furnished by Farmers	Smelter at Union								
			5,000	$200,000	25	100		1,561		$12 75

JEFFERSON COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	Valle Mining Co.	Valle Milling Co.	451¼		$54 00		$19,902	$24,367	$44,269
2	Furnished by farmers	Smelter at Union	250		52 50			13,125	13,125
			701¼		$53 47		$19,902	$37,492	$57,394

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

JEFFERSON COUNTY.

Office number.	Mine owner or company.	Operator.	Employes.		No. days worked producing ore.	No. days development work.	No. of men prospecting.	Wages paid.	Machinery employed.									
			Miners.	Other help.					Concen'ing plants.	No. hand jig plants.	No. boilers.	No. steam pumps.	No. air compressors.	No. steam hoisters.	No. horse hoisters.	No. crushers.	No. steam jigs.	No. hand jigs.
1	Valle Mining Co.	Valle Mining Co.	100	16	110					2	1				25			2
2	Furnished by farmers.	Smelter at Union.																
			100	16	110					2	1				25			2

FRANKLIN COUNTY.

Office number.	Mine owner or company.	Operator.	Acres of land leased or owned.	Amount of capital.	No. of shafts operated.	Average depth of shafts.	Tons of zinc ore.		Price received for	
							Zinc.	Silicate.	Zinc.	Silicate.
1	Belew Mining Co.	Belew Mining Co.	40	30,000	2	200				
2	Great Western L. & B. Co.	Great Western L. & B. Co.	226	100,000	1	70				
3	Furnished smelter at Union by farmers.									
			266	$130,000	3	160				

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

FRANKLIN COUNTY.

Office number.	Mine owner or company.	Operator.	Tons of lead ores.		Price received for		Receipts from		Total amount received for both lead and zinc.
			Lead.	Dry-bone.	Lead.	Dry-bone.	Zinc.	Lead.	
1	Belew Mining Co.	Below Mining Co.	402	....	$46 00	....	....	$18,493	$18,493
2	Great Western L. & B. Co.	Great Western L. & B. Co.	5	....	47 00	....	....	235	235
3	Furnished smelter at Union by farmers.	....	600	....	51 50	....	....	30,900	30,900
			1,007	....	$49 27	....	....	$49,628	$49,628

FRANKLIN COUNTY.

Office number.	Mine owner or company.	Operator.	Employes.		No. days worked producing ore.	No. days' development work.	No. of men prospecting.	Wages paid.	Machinery employed.									
			Miners.	Other help.					No. concen'ing plants.	No. hand jig plants.	No. boilers.	No. steam pumps.	No. air compressors.	No. steam hoisters.	No. horse hoisters.	No. crushers.	No. steam jigs.	No. hand jigs.
1	Belew Mining Co.	Belew Mining Co.	7	5	150	163	....	$1 75	....	1	2	4	1	2	....	....	....	2
2	Great Western L. & B. Co.	Great Western L. & B. Co.	....	....	....	250	11	1 50	....	....	2	1	....	1	....	....	1	....
3	Furnished smelters by farmers.	....	16	13	....	....	....	....	....	....	....	....	....	....	....	....	....	....
			23	18	150	413	11	$1 75	....	1	4	5	1	3	....	....	1	2

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

WASHINGTON COUNTY.

Office number	Mine owner or company.	Operator.	Acres of land leased or owned	Amount of capital	No. of shafts operated	Average depth of shaft	Tons of zinc ores.		Price received for	
							Zinc	Silicate	Zinc	Silicate
1	American Lead and Baryta Co.	Lessees	8,600		10	60				
2	Renault Lead Co.	Independent Miners.	10,824	300,000	20	60				
3	Shibboleth Lead Co. (120 days)	Now American Lead & B. Co.								
4	Furnished by farmers to smelters.									
			19,424	$300,000	30	60				

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

WASHINGTON COUNTY.

Office number	Mine owner or company.	Operator.	Tons of lead ores.		Prices received for		Receipts from		Total amount received for both lead and zinc
			Lead	Dry-bone	Lead	Dry-bone	Zinc	Lead	
1	American Lead and Baryta Co.	Lessees.	294	....	$45 50	......	....	$13,365	$13,365
2	Renault Lead Co.	Independent Miners.	344½	....	45 50	......	....	15,652	15,652
3	Shibboleth Lead Co.	Now American Lead & B. Co.	480	....	46 00	......	....	22,080	22,080
4	Furnished by farmers to smelters.		716	....	47 00	......	....	33,652	33,652
			1,834½	....	$46 25	......	....	$84,749	$84,749

EMPLOYES, EQUIPMENT, TONNAGE AND VALUE—Continued.

WASHINGTON COUNTY.

Office number	Mine owner or company.	Operator.	Employes.		No. days worked producing ore	No. days development work	No. of men prospecting	Wages paid	Machinery employed.									
			Miners	Other help					Concen'ing plants	No. hand jig plants	No. boilers	No. steam pumps	No. air compressors	No. steam hoisters	No. Horse hoisters	No. crushers	No. steam jigs	No. hand jigs
1	American Lead and Baryta Co.	Lessees													3			
2	Benault Lead Co.	Independent Miners	30	10	300	300	25	$1 25			1	2			5			
3	Shibboleth Lead Co (120 days)	Now American Lead & B. Co.																
4	Furnished by farmers to smelters.																	
			30	10	300	300	25	$1 25			1	2			8			

ACCIDENTS.

Compared with 1900, accidents for the year make a most favorable showing. With an excess in the production of lead and zinc ores amounting to 134,284,000 pounds, or an increase of 25 per cent over 1900, yet the number of accidents are 17.70 per cent less. Another way of making comparisons and the better one, we think, is to find the number pounds of ore mined for each life lost. For 1901, there was mined 16,288,000 pounds of lead and zinc ore for each life lost, while for 1900, only 10,260,000 pounds were mined per life lost, showing 4,028,000 more pounds mined, or an increase of 39 per cent with less life lost.

The total number of accidents for the year was 65 of which 41 were fatal and 24 were non-fatal, as against a total of 79 accidents for 1900, of which 52 were fatal and 27 non-fatal.

This year 19 wives were made widows, and 44 children left fatherless by the accidents. Tables 9, 10 and 11 furnish the details as to occupation, cause of accidents, single and married men killed and injured.

Mine operators are requested to comply with the law and notify this office by wire when a fatal accident occurs.

JASPER COUNTY.

Thomas Richardson, the hoisterman at the Lincoln Mining Company's mine, was instantly killed January 3, 1901. He was a married man and the father of three children. The shieve block in the derrick broke and the falling timber struck him on the head. Evidence at inquest showed that the timber on which the shieve wheel rested was faulty and not properly braced.

January 20, 1901, W. D. Cook, the hoisterman at work at the Stevenson shaft on the Boston-Duenweg Mining Company's property, was killed by falling down the shaft. It appears that the hoisterman was last seen at 10 p. m. of the day of the accident, working at the hoister on top of ground and there was no one else working that night. The next morning he was found dead in the bottom of the shaft.

The coroner's verdict was: "Came to his death by falling accidently into the east end pump shaft at Duenweg."

March 4, 1901. Five men were killed and three injured by an explosion of powder at the Englewood Mine at Center Valley.

Wm. Buzzard, widower with two children.
Fritz Morris, married.
George Wilson, married.
Hale Foster, single.
Edmund Stothard, single.

The mine, after a suspension of work for some time, had been started up again, and only about ten days prior to the accident. At the time of the accident the men were engaged in cutting a prospect drift which had been driven in about ten feet from the shaft. Five men were working in the drift, and in the sump six feet below, two others; the ground boss, Thos Dunnels, was standing on the hoister platform, when the explosion occurred. One of the injured men made the statement that they had put off a number of shots in the morning, and that a box of powder was sent down and taken into the drift where the men were working. That, at the time of the accident, the men were squibbing the shots. He thought that in squibbing the shots some one must have exploded a shot that had failed to go off in the morning, or that in some way the box of powder had been exploded. The explosion was terrific, shaking all the derricks in the neighboring mining camps. The ground boss was shot up into the air and fell 30 feet away from the shaft; the hoister house was destroyed, its timbers falling in a confused mass. The impression prevailed generally among the miners that it was the explosion of powder while squibbing that caused the accident.

The coroner deemed an inquest unnecessary after examining a number of witnesses and decided that the men came to their death by an unavoidable accident, for which no one was responsible.

May 8, 1901. Wm. Bowerman, a miner employed at the Lackawanna Mine on the property of the United Zinc Companies, at Chitwood Hollow, was instantly killed. It appears that the deceased with two others had been working at the head of the drift and had put in a small shot in the face about 20 minutes before the accident occurred. Bowerman started into the drift soon after the shot exploded and one of his associates called him back; after waiting what they thought a reasonable time, all three started toward the spot where the shot had been fired. Bowerman passed his associates and was some distance in advance of them. At this time all three stopped to watch the dirt roll down the stope, when suddenly and without warning, a great mass of rock fell from the roof over the drift, crushing Bowerman's skull and covering his entire body under its crushing weight. The ground was considered extra safe at the time by the ground foreman and superintendent of the mine, it having been examined carefully day after day. We visited the mine a short time after the accident, finding that a snow shed had been built in the drift for the better protection of the men; this was carried as close to the face as the progress of the work would permit.

The coroner's verdict was, that Mr. Bowerman came to his death by being crushed by a slab or boulder falling from the roof of the drift, and that said accident was unavoidable and no blame attached to the company or its employes.

May 13, 1901. William Morrison and Chas. Clabaugh, miners at work in a mine belonging to the Pleasant Valley Mining Company, were instantly killed by drilling into an old and unexploded shot. The superintendent of the mine, knowing of these shots, warned the men the Saturday evening before the accident. It also appears that the ground boss, just prior to the unfortunate men going to work, also warned them about being careful. The ground boss states that in an incredible short time after his warning the old shot went off with the disastrous result mentioned. Chas. Clabaugh left a wife and two children. Morrison was a single man and but 22 years of age. The coroner's verdict was: "Purely accidental and no blame attached to any person or persons. Under the circumstances we feel that the deceased were too careless and reckless.

May 29, 1901. Chas. Breece, a miner employed by the Cliff Mining Company, on the Granby land, was almost instantly killed by the fall of a boulder from the roof. The deceased left a wife, but no chlidren. It appears that Breece had just stepped on the platform to commence shoveling when a boulder about the size of a man's head, fell, fracturing his skull. From what is learned it would seem that there was a soapstone pocket out of which this boulder fell, and which it is claimed was chimneyed up until the timbers gave out. This does not appear to us a condition that should exist in a well conducted mine. Every mine should at all times have sufficient timber on hand to meet emergencies of this nature. Promptness in timbering when the least possibility of danger is found lurking, has saved many lives and many mines. There is enough of the unseen dangers in mines to be compelled to risk without taking chances on those known to exist.

The coroner's verdict was: "Unavoidable and no blame attached to company or its employes."

July 13, 1901. Mathew Campbell, a miner 62 years of age, married and the father of six children, was killed by falling down a shaft operated on the Missouri Lead and Zinc Company's land, by Campbell and Bellemy. The deceased was a member of the last named firm, and his partner was his son-in-law. The deceased was being lowered down the shaft by his partner, when about ten feet from the surface the brake hook broke on the horse hoister, causing him to fall a distance of 135 feet to the bottom. After being rescued from the shaft he was at first thought to be dead, but he regained consciousness, but suffered intensely until a few moments before he died. The accident occurred at 9:30 a. m. and he died at 1:30 p. m. The coroner's verdict was: "Unavoidable accident."

July 27, 1901. Columbus Sparks, a miner working at the Old Carnahan Mine, operated by the Sangamo Mining and Milling Company, was over come by powder smoke and fell in the sump. It appears that the deceased had gone to the bottom of the shaft to start the pump after some shots had been fired. He evidently went down in the shaft too soon after the shots had been fired, and, as he was being hoisted out, fell from the tub into the water in the sump which was about 12 feet in depth. The deceased was 35 years of age and a single man. The coroner's verdict was, that Oliver Sparks came to his death from the effects of gas and the testimony does not show any one to blame.

August 3, 1901. R. J. Bennett, a pumpman working at the Independence lease on the M. C. Conkey property, was killed by a block of wood falling down the shaft and striking him on the head. The deceased had signaled for some drills and at the time of the accident was the only man down in the mine. He was, by some, claimed to have been sitting on the pump, located about 20 feet from the end of an incline where there was a sump of water; that, as he had been complaining of not feeling well, he had become faint and fell into the water. He had a fearful wound on his head, and parties who said that a block of wood, which was afterwards found down in the shaft, thrown down the shaft from the surface, not intentionally, but in an effort to throw in the same car that was to take the drills down. It bounded over the car and into the shaft; this block of wood, 8x8 and a foot long, it is thought, struck the deceased and knocked him into the water. The coroner's verdict was: "Accidental death without negligence on the part of the company."

April 9, 1901. Japp Ellis, a powderman at work for the Sharpsburg Mining Company, was killed by a premature explosion of a shot blast. The deceased was engaged in loading a number of holes and it is thought that in reaching down after his powder, that his lamp came in contact with the fuse placed in one of the shot holes, without his knowledge. This is all surmise as no one saw him at the time, as there was no one else in the mine at the time. The coroner's verdict was: "Death by accident; lamp set fire to a blast."

September 2, 1901. C. Jackson, a miner in the employ of the Lincoln *Mining Company*, was killed by a wheel of a tram car falling on him. The deceased was a single man; had worked only five hours in a mine of any kind when he was killed. His presence in the shaft at the time cannot be accounted for, as his work did not require his presence at the bottom of the shaft at that time of the day for any purpose. When found by a fellow workman, he was unconscious and never regained consciousness. A tram car was run over the mouth of the shaft, when, from some cause, a wheel came off the car and fell in the shaft striking the deceased on the head. No inquest deemed necessary.

September 6, 1901. W. B. Hudson, a ground foreman in the employ of the Duluth Zinc Company, was killed by a fall of roof. The deceased, as ground boss, was giving his personal attention to securing the roof at the point where the fall occurred. It appears that a new drift had been started but a short time and reached a distance of but 18 feet from the main drift; the ground boss noticing that it needed trimming and perhaps a little suspicious of the conditions, put in a shot himself, using only a small charge of powder, said to be only one or two sticks of dynamite. The shot appears to have loosened a portion of the roof at the intersection of the new with the main drift, and before the smoke had fully cleared away and an opportunity furnished to notice the condition of the roof after the shot, the deceased ventured in with the result that a large mass of rock and dirt fell on him while in a stooping position. His death was instaneous, his injuries left no doubt on this point, his entire head and face was mashed out of all human resemblance. The deceased is described as a man of excellent habits, about 35 years of age. He left a wife and two small children; he carried no insurance. The coroner's verdict was: "Unavoidable accident."

September 6, 1901. Rolla Smith, a miner at the Kohinoor Mines on the Continental Lead and Zinc Mining Company's property, was killed by a falling boulder. The deceased and a fellow workman by the name of Hans, were at the time of the accident at work in the drift spading, when a slab of rock about ten feet long and five feet wide was noticed to move from the side of the drift. Both men saw it at the same time and each made a desperate effort to get out of its way. Hans succeeded in eluding its crushing weight and escaped with a few bruises—not so poor Smith, for he was caught and pinioned to the ground. The miners soon released him from the weight of the rock and tenderly conveyed him to the surface, where he expired in about five minutes. The ground at this mine was considered safe, there having been no visible reason for considering it otherwise. The deceased was a great favorite among his fellow miners. He was 27 years of age and left a wife and one child. The coroner's verdict was: "He came to his death by a falling boulder or slab of rock from the side of the drift; that the falling was unforeseen and no blame attached to company or any one."

October 5, 1901. Jas. Montjoy, a miner employed at the Dell C. Mine on the McKinley lease, was instantly killed by a fall of roof. It appears that there were five men at work in the ground as usual, when the ground boss, Jack Griffith, noticed a defect in the roof which seemed to have become loose. He called to the men to jump, and all did so escaping without injury except Montjoy, who, in the effort to turn and get away, slipped and was caught by the large slab of limestone. The young man was carried to the surface by his fellow workmen, but expired in about five minutes. The coroner's verdict was: "Purely accidental, and no one to blame, as all men employed were experienced miners and there was plenty of timber constantly on hand and orders issued to use the same wherever any soft places were encountered."

October 9, 1901. Claude Smith and John Blagg, miners employed at the Beacon Hill Mine on the Leonard Mercantile and Realty Company land, were killed instantly by a premature explosion of a blast. The two unfortunates and Chas. Tucker, the hoisterman, were the only men at work in the mine on the night of the accident, and the fact that Tucker was on the surface at his post of duty, accounts for his escape. The men went down the shaft after supper and entered the short drift that was just started. They prepared seven shots, a fuse being attached to each and the men gave the signal to the hoisterman to be ready to hoist them out as soon as they could light the fuse. Presently the hoisterman saw one of the men place his lamp in the tub and he kept a constant look-out, well knowing that quick work was necessary as soon as the men got into the tub. While watching to see the men get in the tub there was a terrific explosion, followed in quick succession until the entire seven distinct shots exploded. The hoisterman was placed in a fearful plight, the concussion put out his light and he was in complete darkness. Realizing the impossibility of the two men in the shaft escaping, it was enough to confuse him, but he seems to have controlled himself and sent word to the Lackawanna shaft for assistance. Four men were sent to the scene of the accident. Upon their arrival Harry Sandlin was selected as the first man to go down. He mounted the tub and was lowered into the shaft, and when down within 20 feet of the bottom, he could go no further on account of the smoke and was hoisted to the surface. After a short time he again made the attempt to go down and was forced back the second time. The miners then poured water down the shaft and in about one-half hour it was possible to go down. Sandlin and Guatney reached the bottom at last and the sight they met must have surpassed in gruesomeness anything they could have conceived of. The torn and mangled bodies of the two luckless miners were intermingled in a mass of rock. After the two had been pulled apart, it was found that Blaggs entire body was shot full of small stones, his right leg from the hip to the knee mangled, most all the flesh being torn from the bone, which was broken in many places. The right foot was completely severed from the limb. The left leg and both arms were broken, and the entire back part of the head blown off. Smith had a large hole in his forehead; right arm was broken; both shoulders broken; left leg broken below the knee and his head and face badly disfigured.

The shaft was 170 feet deep, and that these two men should use a fuse when a battery had been exclusively used here, is an astonishing thing. Then to light the seven shots separately, and hope to get into the tub and reach the surface under such circumstances, was not only reckless, but a violation of the law governing in such cases. The drift in this case was not far enough in to make the conditions different from that of shaft sinking, and with the law and better facilities for firing shots in a shaft in opposition to using a fuse is nothing short of recklessness. Had these seven been fired from above by a battery these two lives would not have been lost. The inspector gives warning, that he will, when he finds shots being fired by fuse in shafts or drifts driven in but a short distance from the shaft bottom, have the guilty parties arrested. Claud Smith was but 28 years of age and left a wife and one child. John Blagg was 30 years of age and also left a wife and one child.

October 22, 1901. James Thompson, a foreman at the Armstrong Mine on the Rob Roy lease, was instantly killed by a fall of roof. It appears that Thompson, with his cousin, was working in a drift driven but a short distance from the shaft. The deceased concluded to leave the face of the drift near the shaft, as it gave evidence of not being as safe as he thought it should be. At the time of the accident both men were engaged in the attempt to make the roof safe, when a slab of slate fell completely enveloping Thompson. His partner attempted unaided to remove the slate, but was compelled to call help; the assistance of five men was not equal to the task, and a rope was then tied to the slate and the hoister employed in removing it. When the rock and dirt were removed, Thompson was already dead. His back was broken at the waist line, four ribs were broken and his entire body lacerated. The deceased was 26 years of age and left a wife and one child. The coroner held an examination and decided an inquest unnecessary.

October 31, 1901. John A. Weston, acting as a back hand at the *drill in the* Lackawanna Mine, was killed by a fall of roof. He was married, but had no children; carried no insurance. While at work a small piece of rock fell some 15 or 20 feet from the roof, fracturing his skull and breaking his leg. The accident occurred at 3:30 in the afternoon; he was taken to the hospital where he died the same evening at 7:30. Coroner's verdict was: "Accidental. No one to blame."

November 29, 1901. Chas. Post, a crusher-feeder employed by the Binghampton Zinc and Lead Company at the Old Mascot Mine, was killed by falling into the star wheel of the rollers. The sickening details of such accidents would not be published was it not for the hope that the reading of the same may deter some one from rashness, or that remedies may be provided by operators against like occurrences. Chas. Post was employed as a crusher-feeder and was at work on the platform with a fellow workman; the first rolls from the breaker became clogged and the jig man had succeeded in getting all the stone out or through but a piece or two, when Post jumped down from the platform and picking up a crowbar began striking at the single remaining rock, the bar missed and struck between the rolls throwing the deceased in such a manner as to cause his head to strike the star wheels, through which it passed leaving the head, arms and shoulders beneath the wheel while the remainder of his body was above. The coroner's verdict was: "Accidental; cause, carelessness; no one to blame but the victim."

This we do not consider a mine accident in the general acceptance of that term. The condition of the mine had nothing to do with it, and as all such accidents help to swell the aggregate and all are called mine accidents, a false impression is created as to the number of accidents that are really due to the hazard of mining.

December 2, 1901. Edward Barrow, a miner in the employ of the Homestead Zinc and Lead Company, died from the effects of foul air. The shaft, in which this poor fellow lost his life, had been considered unsafe because of the foul air generated in it. In addition to this, it had not been used for some time. That preparations were made to open it up and use it as an air shaft is admitted. This being so some one must go down to prepare it for use. We learn that the superintendent and also the ground boss, were present and warned Barrow of its dangers. In the face of the fact that the shaft was known to be dangerous and no other means adopted for driving out the foul air before permitting this victim to descend, we regard the warning given as the veriest rot. Barrow could have been prevented from going down to his death by the simple command not to do so or attempt it.

December 19, 1901. Avery Breedin, back-hand at the drill in Mine No. 3, on the Perry lease, was killed by a premature blast. It appears *that the deceased* was assisting Brumback, the machine man, in loading some holes, some of which were squibbed and at the time of the accident Brumback was loading with a metal spoon, when the explosion occurred. Breeden was killed and Brumback was badly injured.

There is a law and penalty concerning the use of metal bars in loading, and we shall make it a point to punish the first man found guilty of such recklessness.

LAWRENCE COUNTY.

January 17, 1901. Ernest Manafee, a miner in the employ of Henry Brumback, was killed by a fall of roof. The deceased was a single man, 22 years of age. At the time of the accident he, with others, was engaged in trimming the roof of the mine. The men were in the act of taking down a boulder, which, it is said, was very much larger than it was thought to be. The boulder fell, striking the pole on which their running board rested, precipitating the two men on the board to the bottom with fatal results to Manafee. There were five men engaged in this work, but fortunately, when the boulder fell, but two men were on the running board. James Lemon was with Manafee at the time of the accident and was thrown off the running board at the same time; but he sustained no serious injury and recovered. No inquest was held, and information given as to why there was no inquest. As this accident occurred prior to our inspectorship, had no opportunity to inquire into it.

THE ROSE BUD MINE CATASTROPHE.

On April 26, 1901, the frightful cave-in occurred at this mine which attracted so much attention throughout all Southwest Missouri. Many mine accidents have occurred in this State in which more men have lost their lives. Here, however, the heart rending scenes and horrible experiences of some of the entombed men is without a parallel in the mining history of this State. No accident that has occurred will compare with it, in that intense sympathy and excitement, created by the harrowing conditions associated with the painful suspense which lasted for 61 long hours. The fact that five men were for so long a time buried under a mountain of dirt and that two of them were still alive, brought into action that magnificent heroism, not confined to our American soldier alone, but possessed in a large degree by our American miner, and made prominent whenever the occasion arises.

We would dismiss and abandon any recital of the harrowing details associated with this accident, were it not our duty to publish it. More than that, the men who are made subject to such risks should have brought *prominently before* them the horrors of such an accident that they may *be influenced to* exercise and learn the lesson of prudence. Then again, the men who control and manage our mines should be confronted with such things, in order, that such consequences may be guarded against: that such a thing as neglecting a speedy remedy for the slightest evidence of weakness may be held too hazardous to postpone for a moment. As a rule, mine accidents do appear to have associated with them more frightful features than accidents resulting in any other line of trade. The darkness and gloom of a mine under such circumstances intensifies the horrors, while the character of the accidents appear to be more frightful in their consequences and results.

This accident occurred in a drift which was driven out from the shaft some 70 feet or more. It was 20 feet high, 20 feet wide, with a distance of 110 feet through the superincumbent material before the surface was reached. There were immediately preceeding the accident 6 men in the drift at work, one of whom went to the surface for more timber, for at the time they were engaged in timbering the roof of this drift. Upon the return of this man from the surface, so sudden and so unexpected at the time, did this cave-in take place, that he found the whole face of the drift caved in and still caving. He called to his fellow miners, but received no reply. He at once repaired to the surface for assistance and to give the alarm, when speedily returning, he was surprised to find the drift caved in almost to the shaft. The five men entombed were:

William Shane, aged 21; Elmer Bigley, aged 28: William Gilham, aged 35; Grant Shane, George Feaster.

The first three were killed and the last two rescued alive. The rescue of the two men developed as genuine heroism as was displayed by our soldiers in the war with Spain.

The men who gallantly assumed such risks as these rescuers did, are deserving of all praise, and it is our pleasure to give this record of the names of those who participated in the rescue. They were:

Samuel and William Coats, leaders: S. Misenhelter, S. Stanifer, E. P. Crumphey, L. Scearcy, T. Miller, I. Crawford, M. Badgett, G. Gardner, L. Gardner, B. Cook, J. Griffin, B. Jones.

This accident occurred at 9:30 in the morning; at 7 p. m. of the same day, the men had not made much headway in penetrating the caved in material. The saving of the shaft was of first importance, and to that end a pen was constructed at the mouth of the drift. In the meantime others had started work on the 110 foot drift, and at last heard signals made on the iron track running through the drift, plainly showing that some of the entombed men were still alive. There is not the same incentive to risk one's life in the rescue of a dead body as there is *in the rescue of those* in whom there is life, and the hope of complete restoration; so the signal proved an inspiration to the courageous party endeavoring to reach their comrades. At 1:10 p. m. on the 27th, the chances of reaching the men brightened: but at times the chances were desperate and almost hopeless as the miners had been driven again and again from the ground, and still some 40 feet of caved-in ground to work through. The men worked in relays as only four men at a time could work. Some 15 or 20 men were on top preparing timber as needed. Now, for 40 feet in this drift the rescue party could stand erect; but there is 30 more feet that intervenes. This further work has to be performed on their hands and knees. At times, as they approached an obstacle, they flattened out their bodies to pass between a large timber and a boulder, pulling themselves through, as it were, in these close places. As the first man would excavate the rock and dirt with his fingers, he would pass it back to the miner following, and he on to the next man, until the excavated material is clear of the little tunnel they have mined through with naked hands. The material was of such a treacherous nature that it required their eyes, ears and best attention always on the alert, for at any moment the slightest disturbance might cause a movement that would bring down upon them tons of dirt and boulders, and they, too, be entombed. Again and again were these brave fellows compelled to retreat for a time, to return and find the work so hazardously performed all to be done over again, new plans devised and new obstacles to be overcome. Such was the trying, patient, risky work engaged in by these brave men, day and night, for nearly three days and nights. On the 28th day of April, at 2 p. m., the dead body of William Shane was recovered and removed to the surface. Much time was yet needed to reach those who were still alive, but at last the miners approached George Feaster. The nerve and endurance displayed by both Shane and Feaster, under the circumstances was simply superb and almost superhuman. Feaster, when reached, was found to have one leg so entwined by a large timber that his foot was locked. Too great a disturbance of the timber might cause another fall, after several attempts to unloose his foot, Feaster himself suggested that they get a rope and force his foot through. This failed and he then begged for a knife that he might sever his own foot from his leg, claiming this is what he would have done had he not lost his own knife. Shane would have done the same, as he had an immense boulder on one foot. At 6:30 that evening Feaster was released and taken out and later Shane.

When one thinks of a man buried under 110 feet of earth, rock and timber, with one dead man making a pillow of his body, and a live man *on top of him so* tortured by pain and his surroundings, that at times *he would become* crazy and in his delerium pound his unfortunate comrade beneath him, in the face with his fists; to have one foot pinioned by a large boulder and remain in this condition 61 hours in total darkness; to hear the approach of the rescuing party and then find them retreating time and again on account of the treacherous material that would constantly cave, makes a sum of torture, horror and pain that one would think beyond all human endurance.

If all men could be made to appreciate and understand the desperate chances that miners are subject to from so many different causes, doubtless a cry would go up for the best possible compensation for men occupying such hazardous positions. The deadly poisonous gases lurking in hidden places; the roof, under which they work, apparently sound today and the silent stealthy work of unforeseen causes during the night render that same roof the next morning a veritable death trap, are conditions much more frequent than the average citizen is aware of. That the prices of all minerals mined underground could be kept up to that figure that would not only furnish the miner more pay, but the operator, too, many of whom encounter serious difficulties also, is a condition greatly to be desired. The only cause furnished this office for this accident is the simple statement: "Cave-in of drift by removal of water from adjoining mines."

We visited the mine immediately upon receipt of the information that an accident had occurred, and witnessed some of the work that was done to rescue the unfortunate victims. Too much cannot be said in commendation of the manner in which the work of rescue was planned and executed. We decided that the mine should be closed and so ordered. The verdict of the coroner's jury was: "Death from unavoidable accident."

May 10, 1901. Patrick Balton, a miner employed at the Hays City Mine, was instantly killed by falling down the shaft. The deceased, with his partner, Mr. Geo. Dresser, had leased the mine, and they were engaged in getting it into shape to operate it. There was a long ladder in the shaft and used much in going down and coming out; it appears that at some previous time a platform had been built in the shaft at a 65-foot drift. This had been taken out with the exception of two sills upon which the timbers rested. The deceased, in going down the ladder, had the misfortune to have one of the rungs in the ladder to slip out. This caused him to fall and it is supposed his head struck the sill from which point he fell to the sump below. There was no inquest. Deceased was insured in the A. O. U. W. for $2,000.

MADISON COUNTY.

July 19, 1901. John Hightower, occupied as a "lander," moving cars on and off the cage at the surface landing at the Catherine Mine, was killed by a blast. The deceased is to blame altogether in this case. Shots were to be fired on the north side of the shaft, and the men had retired to the south side after lighting the fuse. All men of the shift who had any occasion to be underground were there, hence there was no special guard placed at the shaft, nor would it have been possible to station a man directly at the shaft, as blast reached that point. While waiting on the south side of shaft for the shots to explode. Hightower came down the shaft for water. His instructions were, that when he needed water to send his pail down. Some of the men heard the cage descend, but supposing that it was an empty car—one due at that time—knowing there was no one above who had any occasion to come down, paid no attention to it. Hightower going to the place where the water is gotten from a roof hole, passed directly in front of and between 40 and 50 feet from the face containing three loaded machine holes. They exploded, and Hightower was found by the men when thev returned to the face a few moments after. Coroner's verdict: "Death by an explosion of dynamite in shaft No. 1 of the Catherine Lead Co."

ST. FRANCOIS COUNTY.

March 11, 1901. G. W. Lincoln, a miner engaged in drilling at the time of the accident, was killed by going back on shot. The deceased was in the employ of the Doe Run Lead Company; a married man about 42 years of age and the father of three children. Lincoln, it appears, with an associate, assisted in lighting a stope hole, while still another party lighted the second hole on the same stope. These shots were prepared with the full knowledge of all concerned. The men all started down the track to seek a place of safety, and the only way to account for Lincoln's death is, that he lost his way and turned round on his tracks and went right back to the point from which he started. The following is a true copy of the testimony taken at the inquest over the body of George Lincoln at Flat River, March 12, 1901:

(Signed) J. H ENGLISH, Coroner.

A. E. Upchurch, 20 years old. "I was acquainted with deceased, *Geo. Lincoln.* I have known him 12 months. I was with him last night just before he was hurt. He was in north end of No. 2 shaft, in north drift. He was working beside me, and when the hole was to be lit I was to fire one hole and Peter Yancy was to fire the other, both to be fired at once. And he was holding light for me so if my light went out I would not be in dark. And when ready to fire Parker Rundle asked Yancy if he was ready, and hollowed and asked me if I was ready, and both answered, 'Yes.' He said, 'Fire,' and for us to light them up. We lit holes. We started out, him in front of me 25 or 30 steps, then I turned a little to right of him and went to an incline engine and never saw him after I passed him until he was found hurt. It was four or five minutes from the time I left him until he was found hurt. The blast that killed him was from hole the other man fired, they were about 50 or 60 steps apart. He started in opposite directions—same way I did—but must have changed course and must have passed back by hole where I had lit to have gotten to where he was when found. We had been at work about 2½ hours when this happened. I always thought that every man was supposed to look out for himself. There is a general alarm always given by hollowing 'fire,' and that alarm was given last night, and every body is supposed to get out of the way. There were about 11 men working in the place where shots were fired.

"A. E. UPCHURCH."

Subscribed and sworn to before me this 12th of March, 1901.

J. H. ENGLISH,
Coroner St. Francois Co.

Parker Rundle, 38 years old, was in the heading with Mr. Lincoln when he was hurt. "I was down below pillow when he was hurt. I gave the alarm to fire. I saw Mr. Lincoln was with Mr. Upchurch and supposed he had come out with him. I called 'fire' twice, and asked Mr. Yancy if he was ready, and asked Mr. Upchurch same question, and I saw Mr. Lincoln with Mr.Upchurch, and then everything got quiet. I told them to light them up. I have no idea why he changed his course as he did. He must have changed course considerably or he could not have got into shots. He was bound to have turned to right to have got where he did. "PARKER RUNDEL."

Subscribed and sworn to before me this 12 of Mrach, 1901.

J. H. ENGLISH,
Coroner of St. Francois Co.

Peter Jensen, 22 years old. "I am a miner. I am an employe of the Doe Run Lead Co. I knew Mr. Lincoln. I was at work in mine last night when he was hurt about half past nine. I was about 25 yards from him at time. I cannot tell anything about how this happened. I did not see him after going to work at 7 o'clock. The first I knew was to hear him groan. I went to him, Fred Rickus was with me when I got to him, he probably lived about three quarters of an hour or possibly an hour. He did not make any statement after I got to him. He did not die until after reaching top of ground. He must have been 20 or 30 feet from where shot fired. He was up against bluff; looked as if he had been blowed there by force of blast.

"PETER JENSEN."

Subscribed and sworn before me this 12th of March, 1901.

J. H. ENGLISH.
Coroner St. Francois Co.

Albert Gasser, 30 years old. "I was at work in mines when Mr. Lincoln was hurt. I was in crowd when alarm was given. Mr. Lincoln was one of four of us. When Mr. Rundle gave alarm and asked if ready, and both men said, 'Yes,' and Parker said, 'Light them up,' and Mr. Lincoln said, 'Fire and gone.' We all started on track, I was the third last man. I was down below switch. I took a certain stop and then I saw one light go to engine and one light go to heading and hollowed, 'Men, come out there, they are firing up there,' and started up there and then thought it would not do for me to go that way, and stopped and went back, and told men I thought some one was going to get hurt, because I knew he would not have time to get out of the way in this direction. The way he started I knew he would not have time to get out, so I did not try to follow him. He must have known the holes where he passed was loaded. I think he aimed to get over the bluff. If he had been quick enough, or holes had not fired so quickly, he could have gotten out safe.

"ALBERT GOSSER."

Subscribed and sworn before me this 12th of March, 1901.

J. H. ENGLISH,
Coroner of St. Francois Co.

State of Missouri,
County of St. Francois.

We, the jury, having been duly sworn and affirmed by J. T. English, coroner of St. Francois county, Mo., diligently to inquire and due presentment make in what manner and by whom Geo. Lincoln, whose body was found at shaft No. 2, at Flat River, Mo., on the 11th day of March, 1901, came to his death, after hearing the evidence, and upon full inquiry concerning the facts and a careful examination of the body, do find that deceased came to his death by a blast firing in Doe Run Shaft No. 2.

W. J. LEVEL, Foreman,
G. W. CLOUD,
J. B. CUNNINGHAM,
H. H. PELL,
W. BRAHAM.

The above is a true copy of verdict of jury in case of Geo. Lincoln.

J. H. ENGLISH,
Coroner.

April 25, 1901. Thomas McAvinney, a miner in the employ of the Derby Lead Company, was instantly killed by a fall of pipe while attempting to hoist the pipe out of the shaft. The deceased was a married man, and the accident occurred in the following manner: The 3 p. m. shift on Monday began hoisting a 5-inch pipe line 200 feet long out of the shaft. Their plan was to attach the wire hoisting rope to the pipe, and after all clamps were loosened, to hoist until one length was above the collar of the shaft. Heavy clamps were attached to the pipe below a cross beam 2 feet 6 inch by 8 inches yellow pine timbers 8 feet between bearings, uncouple the top length and remove same, then attach wire rope below again and hoist with engine until a second length was above the top of the shaft, when this was uncoupled and removed as above. At the end of this shift, 11 p. m. three lengths had been thus removed. No work was done at the pipe during next shift, but at 7 p. m. on the 23rd, McAvinney and others started to remove the balance of the pipe. After having pulled up the pipe and fastened the clamps as previously, one of the men loosened the clamp above, to which the hoisting rope had previously been attached. McAvinney was standing on the 2-foot 6-inch by 8-foot timbers supporting the clamps which held the weight of the pipe and was within 18 feet of the surface, when the hoisting clamp was loosened and dropped down on the clamp below. Both timbers broke precipitating the pipe, timbers and McAvinney to the bottom of the shaft, a distance of about 190 feet. He was instantly killed.

These same timbers had previously sustained the weight of all the pipe the night before, besides the weight of two men, and when they broke they had on them 800 pounds less weight of pipe, besides the weight of one man less. The verdict of the coroner's jury was, that deceased came to his death by the breaking of timbers on which he was standing.

June 25, 1901. Chas. Carver, a miner and at work with others was sinking a shaft for the Derby Lead Company at Elvins, Mo., when he was killed by falling down the shaft. Deceased was a married man and the father of two children. He was a member of the Woodmen Order, and had insurance through this membership. From the testimony delivered before the coroner's jury, it appears that the deceased, with two others, got on a tub without lights, to go down in the shaft after their lunch time. One of the men got inside the tub which was about 8 feet in depth while the deceased and another miner stood on the rim of the tub. They did not take the yoke with them that acted as a guide through the timbered portion of the shaft but left it on top. When about 275 feet from the surface, the tub began spinning around, when some one of them put his hand out to stop the spinning. This apparently caused the bucket to so swing as to strike one of the guides, then, when it swung to the opposite side of the compartment, the bottom of the tub struck the top of the timber, causing it to tilt, throwing the deceased from the edge of the tub on which he was standing, and he was precipitated to the bottom of the shaft, some 190 feet or more. The men in the tub missed Carver as they approached a light in the shaft and securing the help of another man, proceeded to the bottom and recovered the body. The following is the verdict of the coroner's jury:

State of Missouri,
County of St. Francois.

We, the jury, having been duly sworn and affirmed by J. H. English, coroner of St. Francois county, Mo., diligently to inquire and due presentment make in what manner and by whom Charles Carver, whose body was found dead at Derby Mines, Elvins, Mo., on the 25th day of June, 1901, came to his death, after having heard the evidence, and upon full inquiry concerning the facts and a careful examination of said body, do find that deceased came to his death by falling off the tub in shaft one at the Derby Lead Mines.

R. BYINGTON, Foreman.
JOHN G. LAYNE,
WM. A. WANN,
J. H. ROLLINS,
A. J. DIXON,
DAN TERRY.

I hereby certify that the above is a correct copy of verdict rendered by jury in inquest held over the body of Charles Carver, June 25, 1901.

J. H. ENGLISH,
Coroner St. Francois Co.

July 1, 1901. J. W. Roll, a miner and one of the firm engaged in mining at this mine, on the property of the Valle Mining Co., was instantly killed by a fall of a boulder from the roof of the drift. It appears from the evidence given before the coroner's jury that the deceased was at work having as an assistant a boy. Roll was at work in a very small drift, it was only about two feet high and 5 feet wide, and he must have certainly considered the rock under which he was working was stratified material, otherwise he would not have taken the chances of working five feet wide under a boulder. The rock fell when deceased was alone as the boy who had gone to the shaft with a load of ore found him buried under the rock when he returned. Following is the verdict of the coroner's jury:

State of Missouri,
County of St. Francois.

We, the jury, having been duly sworn and affirmed by J. H. English, coroner of St. Francois county, Missouri, diligently to inquiry and due presentment make in what manner and by whom J. W. Roll, whose body was found at Valle Mines on the 1st day of July 1901, came to his death, after having heard the evidence and made a careful examination of the body and full inquiry concerning the facts, came to his death by accident.

JAMES H. KELLEY, Foreman,
FRANK APPLEBURRY,
HENRY GRINSHAW,
WM. CHRISTOPHER,
W. I. TURLEY,
THOS. RICHARDSON.

September 3, 1901. Harry Mestrock, an employe of the St. Louis Smelting and Refining Co., acting as cager, was killed by a mine car. At the time of the accident the deceased appears to have been standing, according to the testimony furnished before the coroner's jury, against a car when the mule driver came to the bottom of the shaft with a full car, cut loose from it and let it go, as was customary. Parties standing close by called to the deceased to look out, but he appears not to have had time to get out of the way before he was caught between the cars. The deceased, after the car struck him, walked out from the cars and was assisted to a seat, and took some water that was offered to him. Evidently the superintendent of the mine, Mr. Swartz, and the foreman, who were near by and witnessed the accident, did not think at the time that it was very serious. The deceased got up from his seat and walked some 30 or 40 steps, and the superintendent started through the mines upon an examination of other matters. The cager was doubtless somewhat to blame as there was plenty of light. The witnesses do not agree at one point. One says the drivers cut loose their cars without warning while another says the drivers usually give an alarm when he cuts loose. Another witness states that the driver is not supposed to give warning when he cuts loose; that it is the cagers business to be on the lookout, and that this driver gave no warning. The verdict of the coroner's jury is as follows:

State of Missouri,
County of St. Francois.

We, the jury, having been duly sworn and affirmed by J. H. English, coroner of St. Francois county, Mo., diligently to inquire and due presentment make in what manner and by whom Harry Mestrok, whose body was found at St. Louis Smelting and Refining Co.'s works on the 3rd day of Sept., 1901, came to his death, after having heard the evidence and upon full inquiry concerning the facts and a careful examination of the body, do find that the deceased came to his death by an accident due to his own negligence in not looking out for the incoming car that struck him.

E. F. PACKARD, Foreman,
TOM WILSON,
N. DUNHAM,
E. B. CLOUD,
JNO. A. HIGGINS,
ROBT. A. LLOYD.

I hereby certify that the above is a correct copy of the verdict in the inquest held over body of Harry Mestrok at the National, Sept. 4, 1901.

J. H. ENGLISH,
Coroner St. Francois Co., Mo.

The deceased lived some 16 or 17 hours after the accident occurred.

November 15, 1901. Lemory Barnes, a miner in the employ of the ~~Catherine~~ Columbia Lead Co., at its mine No. 2, was instantly killed by falling down the shaft. From what is gathered from the testimony before the coroner, it appears the deceased was only 18 years of age; had no experience as a miner and had work but two and a half days in the mine. He seemed to have had but one person at the mine who knew him and he, from his testimony, was anxious concerning the young man, and endeavored to get him to wait for another cage when he would have gone down with him. The distance between the curbing and the cage, *it appears to us*, is unusally wide and too wide, otherwise this *unfortunate young* man could not have fallen through so easily. From the testimony it is gathered that no men were allowed to get on the cage from the landing where the deceased fell through, except machine men with tools. Barnes, according to the rules, should have gotten on at the upper landing; but the cage, unless waiting for machine men with drills, should not have been left standing there with an opening or passage way to the cage, inviting the men to step on. It may be the deceased, with so little experience, had been getting on at the upper landing where the space between the cage and the floor would not permit of a man falling between them; then again there appears to have been some steam or fog arising out of the shaft that morning which hid the space or trap between the cage and the cribbing. The coroner's jury returned the following verdict:

State of Missouri,
County of St. Francois.

We, the jury, having been duly sworn and affirmed by J. H. English, coroner of St. Francois county, Mo., diligently to inquire and due presentment make in what manner and by whom Lemroy Barnes, whose body was found at Columbia Shaft No. 2, on November 15, 1901, came to his death, after having heard the testimony and a full inqury concerning the facts and a careful examination of the body, do find that the deceased came to his death by accidental fall in the shaft.

W. R. HILL, Foreman,
C. L. GRAVES,
HENRY BRANDELL,
J. M. MOORE,
B. McDANIEL,
A. WAGLEY.

TABLE VIII.—Accident at Lead and Zinc

JASPER

Name of injured person.	With whom employed.	Occupation of injured person.	Date of accident.	Age	Single	Married	No. of children	Non-fatal	Fatal
Thos. Richardson	Lincoln Mining Co	Hoisterman	Jan. 3, 1901			1	3		1
W. D. Cook	Boston-Duenweg M. Co.	"	20, 1901		1				1
Art Vincent	Grace Mine	Drill Helper	Feb. 4, 1901		1			1	
John Collins	"	"	4, 1901		1			1	
Frank Strasburg	"	Drillman	4, 1901		1			1	
Wm. Buzzard	Englewood Mine	Miner	Mch. 4, 1901			1	2		1
Fitz Morris	" "	"	4, 1901			1			1
Geo. Wilson	" "	"	4, 1901			1			1
Hale Foster	" "	"	4, 1901		1				1
Ed. Strothard	" "	"	4, 1901		1				1
Wm. Daniels	" "	"	4, 1901			1		1	
Thos. Dunnels	" "	Ground Boss	4, 1901		1			1	
John Burton	" "	Miner	4, 1901		1			1	
Chas. Seaman	American Z., L. and S. Co	"	8, 1901			1		1	
John Moss	Hathcock & Co., Davey Land	Miner	27, 1901			1		1	
Ira Gibbons	Atlas Mining Co.	"	Apr. 3, 1901		1			1	
J. Harper	Marion Mine Continental L. & Z. Co.	"	May 7, 1901		1			1	
Wm. Bowerman	Lackawanna Mine, United Zinc Co.	"	8, 1901		1				1
Wm. Morrison	Pleasant Valley M. Co.	"	13, 1901		1				1
Chas. Clabaugh	" " "	"	13, 1901			1	2		1
Chas. Breece	Cliff Mine, Granby Land	"	29, 1901	29		1			1
Roy Shannon	Brooks Ground Zincite	Hoisterman	29, 1901	25	1				1
J. B Nichols	Gordon Mine, Perry Lease	Miner	July 9, 1901			1		1	
Mathew Campbell	Campbell & Bellany, Mo. Lead and Zinc Co	"	13, 1901	62		1	6		1
Columbus Sparks	Sangamo Mining Co	"	27, 1901		1				1
R. J. Bennett	Independent Lease	"	Aug. 3, 1901	50		w	1		1
Japp Ellis	Sharpsburg Mining Co	"	9, 1901			1	3		1
Chas. Harrington	Marion Mine	"	16, 1901		1			1	
Joe Barnwell	Perry Leases	"	15, 1901		1				1
J. A. Holmes	Zolo Mine	"	30, 1901			1		1	
C. Jackson	Lincoln Mining Co	"	Sept. 2, 1901		1				1
W. B. Hudson	Duluth M., Mo. Z. Fields	Ground Boss	6, 1901	35		1	2		1
Rollo Smith	Kohinoor Mine, Continental Lead and Zinc Co	Miner	6, 1901	27		1	1		1
J. J. McLelland	Blue Bell, Mo. Zinc Fields.	Sup't. of Mine	7, 1901		1			1	
J. G. Fort	Culbertson&Co. Mo. Z. Flds	Miner	25, 1901			1		1	
C. A. Liestakow	Beulah C. M., Mo. Z. Fields	Crusher feeder	27, 1901			1		1	
Bally Brown	Hillside Mining Co	Miner	Oct. 2, 1901		1			1	
James Montjoy	Dell C. McKinley Lease	"	5, 1901		1				1
John Bannister	Corn Palace, Granby Land	Ground boss	6, 1901			1		1	
Alex Smith	Doolittle, Neeley Tract	Miner	7, 1901			1		1	
Claud Smith	Beacon Hill Z. Mining Co. Leonard Land	"	9, 1901	28		1	1		1
John M. Blagg	Beacon Hill Z. Mining Co. Leonard Land	"	9, 1901	30		1	1		1
James Thompson	Armstrong Mine, Robert Roy Lease	Foreman	22, 1901			1	1		1
W Henry	Hildreth & Co	Miner	29, 1901		1			1	
John Weston	Lackawanna Mine, United Zinc Co	"	31, 1901			1			1
J. J. Thompson	Perry Lease, Mine No. 1	"	Nov. 5, 1901		1			1	
C. Post	Binghampton, L. & Z. Co	Crusher-feeder	29, 1901	[illegible]		1			1
Edw. Barrow	Homestead Z. and L. Co.	Miner	Dec. 2, 1901	[illegible]	1				1
Avory Breeden	Perry Lease, Mine No. 3	Drillman	19, 1901		1				1
R. Brumbeck	" "	"	19, 1901		1			1	
					25	25	23	22	28

Mines during the year ending December 31st, 1901.

COUNTY.

Insured.			Nature of accident.	Coroner's verdict.
Yes.	No.	Amount.		
..	1		Break in machinery	
..	1		Fall in shaft	
1	..		Powder explosion	
1	..		" "	
1	..		" "	
1	..		" "	Unavoidable accident.
1	..		" "	" "
1	..		" "	" "
1	..		" "	" "
1	..		" "	" "
1	..		" "	
1	..		" "	
1	..		" "	
..	1		Premature explosion	
1	..		Break in machinery	
..	1		Fall of tub which he carelessly undermined	
1	..		Fall of roof	
..	1		"	
..	1		Drilled into unexploded shot	Purely accidental.
..	1		" "	" "
1	..		Fall of rock	Unavoidable accident.
..	1		Falling down shaft	Accidental.
..	1		Explosion of powder	
..	1		Fell down shaft; break of horse hoister	Unavoidable accident.
1	..	$1,000	Asphyxiated; due to powder smoke	Death from suffocation.
..	1		Fall of block of wood down shaft	Accidental death.
1	..		Premature explosion	" "
..	1		Returned too soon on shot	No inquest.
..	1		Fell out of tub in shaft	"
..	1		Struck by tub in shaft	
..	1		Fall of wheel down shaft	No inquest.
..	1		Fall of roof	Unavoidable accident.
..	1		"	No inquest.
..	1		Fell into tank of very hot water	
..	1		Drop of tub due to loose brake on hoister	
..	1		While breaking boulder small pieces of rock put his eye out	
..	1		Hoisterman allowed tub to get away from him	
1	..		Fall of roof	Accidental.
..	1		Boulder fell on him	
..	1		Explosion of boiler	
..	1		Premature explosion of shot	No inquest.
..	1		" "	"
..	1		Fall of rock	Accidental.
..	1		Fell in shaft	
..	1		Fall of rock	Accidental.
1	..		Hoisterman sent tub to bottom with too much force	
1	..		Killed by machinery	Own carelessness.
1	..		Foul air	Accidental.
1	..		Tamping shot with metal bar	Carelessness.
1	..		" " "	
22	28			

ACCIDENTS AT LEAD AND

MADISON

Name of injured person.	With whom employed.	Occupation of injured person.	Date of accident.	Age	Single	Married	No. of children.	Non-fatal	Fatal
John Hightower...	Catherine Lead Co........	Cager on surface	July 19, 1901	40	..	1	7	..	1

ST. FRANCOIS

Name of injured person.	With whom employed.	Occupation of injured person.	Date of accident.	Age	Single	Married	No. of children.	Non-fatal	Fatal
G. W. Lincoln......	Doe Run Lead Co..........	Miner............	Mch. 11, 1901	42	..	1	3	..	1
Thos. McAvinney.	Derby Lead Co............	"	Apr. 25, 1901	....	..	1	..	..	1
Chas. Carver.......	"	"	June 25, 1901	....	..	1	2	..	1
J. W. Roll..........	Valle Mining Co...........	"	July 1, 1901	....	1	..	..	..	1
Harry Mestrock....	St. L. Smelt'g & Refin'g Co.	"	Sept. 3, 1901	....	1	..	..	..	1
Lemroy Barnes ...	Columbia Lead Co.........	"	Nov. 15, 1901	....	1	..	..	..	1
					3	3	5	..	6

LAWRENCE

Name of injured person.	With whom employed.	Occupation of injured person.	Date of accident.	Age	Single	Married	No. of children.	Non-fatal	Fatal
James Lemon.....	Henry Brumbeck..........	Miner............	Jan. 17, 1991	23	1	..	..	..	1
Ernest Menifee....	" "	"	" 17, 1901	22	1	..	..	..	1
Elmer Bigley.......	Rose Bud Mining Co......	"	Apr. 26, 1901	30	..	1	.	.	1
Wm. Shane.........	" "	"	" 26, 1901	20	1	..	..	..	1
Wm. Gilham.......	" "	Ground foreman.	" 26, 1901	....	..	1	4		1
Geo. Feaster.......	" "	Miner............	" 26, 1901	22	1	..	..	1	..
Grant Shane.......	" "	"	" 26, 1901	32	..	1		1	..
Pat Balton.........	Ozark Mining Co...........	"	May 10, 1901	59	..	1	5	.	1
					4	4	9	2	6

ZINC MINES—Continued.

COUNTY.

Insured. Yes.	Insured. No.	Insured. Amount.	Nature of accident.	Coroner's verdict.
..	1	....	Killed by blast	Death caused by expl. of dynamite.

COUNTY.

Insured. Yes.	Insured. No.	Insured. Amount.	Nature of accident.	Coroner's verdict.
1	..	$1,000	Lost his way after fuse had been lit, and went back on shot	Death from blast fired at Doe Run mine.
..	1	....	Breaking of platform	Death from breaking of timbers on which he was standing.
1	..	....	Falling down shaft	Accidental.
..	1	....	Fall of roof	Accident by falling rocks.
..	1	....	Killed by mine car	Accident due to own carelessness.
..	1	....	Fell down shaft	Accidental death, caused by falling down shaft.
2	4	$1,000		

COUNTY.

Insured. Yes.	Insured. No.	Insured. Amount.	Nature of accident.	Coroner's verdict.
..	1	....	Fall of roof	No inquest.
..	1	....	"	"
..	1	....	Cave-in	Death from unavoidable accident.
..	1	....	"	" " "
1	..	$1,000	"	" " "
..	1	....	"	
..	1	....	"	
..	1	....	Fall from ladder on going down mine	No inquest.
1	7	....		

TABLE IX.

Cause of accidents and number injured from each cause.

	Fatal.	Non-fatal.	Total.
Machinery	2	1	3
Falling in shaft	6	2	8
Powder explosion	5	7	12
Premature explosion	3	1	4
Fall of tub and other articles in shaft	2	5	7
Fall of roof	11	1	12
Drilling into unexploded shots	2	....	2
Asphixiated	1	....	1
Returning too soon on shot	1	....	1
Falling into tank of hot water	....	1	1
Breaking boulder, piece struck the eye of injured person	....	1	1
Explosion of boiler	....	1	1
Foul air	1	....	1
Tamping with metal bar	1	1	2
By blasts	1	1	2
Breaking of platform	1	....	1
Mine car	1	....	1
Cave-in	3	2	5
Total	41	24	65

TABLE X.

Occupation of injured persons.

Occupation.	Fatal.	Non-fatal.	Total.
Hoistermen	3	....	3
Drillmen	1	4	5
Miners	32	16	48
Superintendent	....	1	1
Ground boss	3	2	5
Crusher feeder	1	1	2
Cager	1	....	1
Total	41	24	65

TABLE XI.

Showing number single and married men injured, insured, widows and orphans.

	Number.
Single men	32
Married men	33
Widows	31
Children	44
Fatal	41
Non-fatal	24
Insured	25
Not insured	39

POSTOFFICE DIRECTORY OF LEAD AND ZINC OPERATORS.

JASPER COUNTY.

Proprietor or name of mine.	Postoffice.
Aida Mining Company	Webb City
Ajax Mining Company	Chicago (84 Wabash Ave.)
American Zinc, Lead and Smelting Company	Carterville
Arkansas Mining Company	Siloam Springs, Ark
Ashcraft & Reynolds	Webb City
Bailey & Stickney	Carthage
B and C Mining Company	Joplin
Bankers Land	Kansas City
Barbee & Yale	Joplin
Bay State Zinc Mining Company	" (box 325)
Backwith-Hall Mining Company	Carthage
Becky Sharp Mining Company	Joplin (219 N. Pearl St.)
Belleville Land and Mining Company	"
Big Bug Mining Company	" (T. M. Nutz.)
Big Six Development Company	Duenweg
Binghampton Zinc and Lead Mining Company	Joplin
Blue Wing Mining Company	"
Boston Get There Zinc Company	Carthage
Boston-Duenweg Mining Company	Duenweg
Boqua Mining Company	Joplin
Bradford-Kansas City Mining Company	Webb City
Brinkley lease	"
Bunco Mining Company	Howard
Budweiser Mining Company	Joplin
Burgner Mining Company	Carterville
Center Creek Mining Company	Webb City
Colonial Zinc and Lead Mining Company	Joplin
Colorado-Joplin Mining and Milling Company	"
Continental Zinc, Lead and Smelting Company	"
Crown Crest Zinc and Lead Mining Company	"
Consolidated Zinc and Lead Mining and Smelting Co	"
Conkey Independent Lease	Webb City
Davey & Son	Carterville
Della "S" Mining Company	Carthage
Dinkelbiehler Lease	Joplin (box 650.)
East Hollow Mining Company	" (box 693.)
Eclipse Land and Mining Company	Carthage
Eldorado Mining Company	Carterville
Eleventh Hour Mining Company	Webb City
Empire Zinc Company	Joplin
Estrada Lease	"
Excel Mining and P. Company	" (622 W. 3rd St.)
Freeman Land and Mining Company	"
Forestal & O'Donnell	Webb City
Funk & Bowman	"
Gilchrist Porter Realty Company	Joplin
Granby Mining and Smelting Company and lessees	"
Hagadorn, R.	Zincite
Harrison, J. W	Fayetteville
Holden Bros. Mining Company	Joplin
Homestead Zinc and Lead Mining Company	Carterville
Hudson Mining Company	Webb City
Ihlseng Mining Company	Carthage
I Know Mine	Joplin
Imperial Mining Company	"
Independence Mining Company	"
Indiana Mining Company	"
Investors Mining Company	Webb City (box 855.)
Ishpeming Mining Company	Carl Junction
Jeanette Mining Company	Joplin (518 Main St.)
John Jackson Mining Company	"
Jim Jackson Mining Company	"
Johnson Willett & Company	Center Valley
Joplin Prospecting Company	Joplin
Katy "C" Mining Company	"
Lead Hill Mining Company	Carthage
Leonard M. & R. Company	Joplin
Leckie Mining Company	"
Lincoln Mining Company	" (box 385)
Lewellen Bros	Zincite
Lucky Tom Mining Company	Carthage
Mallett & Freeman	Joplin
McConnell Mining Company	"
McKinley Mining Company	Webb City
McMillan & Raymond	Howard
Manhattan Mining Company	Webb City

JASPER COUNTY—Continued.

Proprietor or name of mine.	Postoffice.
Massassoit Mining Company	Joplin (box 175)
Midway Mines	"
Mignonette Mining Company	Carthage
Missouri Lead and Zinc Company and lessees	Joplin
Missouri Zinc Fields Company	Webb City
Mistletoe Mining Company	Carterville
Mohaska Mining Company	Joplin
Montgomery Lead and Zinc Mining Company	"
Mt. Ararat Mining Company	Webb City
Neely Mining Company	Reeds
North Heights Mining and Milling Company	Lincoln, Ill. (D. H. Hart)
North Joplin Mining Company	Joplin
Old Colony Z. and S. Company	Neck City
Olympia Zinc Company	Joplin
Owensboro-Joplin Mining Company	"
Oxford Mining Company	Carl Junction
Parker & Johnson	Webb City
Perkins Zinc Company	Zincite
Perry Laase Mining Company	Joplin
Phelps & Connor	Webb City
Pleasant Valley Mining Company	Carthage
Porto Rico Mining Company	"
Plutocrat Mining Company	Joplin
Plymouth Rock Mining Company	"
Quaker Mining Company	"
Rabbits' Foot Zinc Mining Company	"
Rannaberger Mining Company	"
Regan Land	Carthage
Rex Mining Company	Joplin
Roaring Springs Mining Company	"
Roberta Mining Company	Carterville
Sadtler Lead and Zinc Company	Duenweg
Sergent Mining Company	Joplin
Sharpsburg Mining Company	Carterville
Short Creek Mining Company	Joplin
South Joplin Land Company	"
South Joplin Lead and Zinc Mining Company	"
Spencer, C. H.	"
Sphinx Mining Company	Neck City
Springer & Page	Joplin
Stuckey Mining Company	Zincite
Sultana Mining Company	Joplin
Ten O'clock Mining Company	Webb City
Triad Mining Company	"
Troup Mining Company	Carterville
United Zinc Companies	Joplin
Venture Mining Company	Zincite
Waddell & Company	Carthage
Warren Lead and Zinc Company	Webb City
West Hollow Mining Company	Zincite
West Joplin Lead and Zinc Company	Joplin
Weyman & McConey	"
Witch Hazel Mining Company	"
Woodward Mine	Webb City
Wright Mining Company	Joplin
Willapus Wallapus Mining Company	Howard
Yale & O'Brien	Joplin

NEWTON COUNTY.

United Zinc Companies	Joplin
Fox River Lead and Zinc Company	Gregg
Alta Mining Company	Kansas City, Mo
Saginaw Lead and Zinc Company	Saginaw, Mo
St. Paul Mining Company	Joplin
Old Spurgeon, Easy Street and Noxall Mining Company	Spurgeon
Henrietta Mining Company	Saginaw
Nemo Mining Company	Joplin
Aunt Patty Mining Company	"
Cora, Jeannette Mining Company	Spurgeon
German-American Mining Company	Saginaw
Gobler Mining and Smelting Company	Joplin
Laughlin & Brown	"
Keystone Lead and Zinc Company	Spring City
The Kansas City Mining and Milling Company	Galena, Kas
Boston-Springfield Zinc Company	Joplin
Williams Land	"
Shoal Creek Mining Company	" (1327 Main St.)
South Shoal Creek Mining Company	"
Wyoming Mining and Milling Company	Granby

LAWRENCE COUNTY.

Proprietor or name of mine.	Postoffice.
United Zinc Companies	Joplin
Stewart Land	Aurora
Mt. Vernon Mining Company	Mt. Vernon
Bell Houston Mining and Smelting Company	St. Louis (712 Union Trust Bl'dg.)
Boston-Aurora Zinc Company	Joplin (19 McKinley Bl'dg.)
Chicago-Aurora Zinc and Lead Company	Aurora
Kentucky Mining Company	"
A. L. Wilfley Land	"
Terre Haute Land and Mining Company	"
Sphalerite Mining Company	Springfield
Decatur Lead and Zinc Company	Aurora
Federal Zinc and Lead Company	"
L. F. Hyde Mining Company	Stotts City
Cleveland-Aurora Mineral Land Company	Aurora
Sandy Hill Mining Company	"

BENTON COUNTY.

Americus Mining and Milling Company	Raymond
Hoover, Fred	Cole Camp
Melton No. 1	"
Rich Hill Mining Company	Raymond
Rockwell Mining Company	"
The Columbia Mining Company	"
The Union Mining Company	"

MORGAN COUNTY.

Cohn & Redmond	Tipton

MONITEAU COUNTY.

Blair Mining Company	Tipton
Fortuna Mining Company	"
Gundling Mining Company	"
Hot Springs Mining Company	"
La Mine Mining Company	Jefferson City
New Jersey Mining Company	Tipton
Shelby Mining Company	"
Standard Lead and Smelting	"

COLE COUNTY.

Blue Jack Mining Company, L. C. Lohman	Jefferson City
Independence Mine, Mrs. J. W. Marsteller	"
Elston Mining Company	Elston
Chambers Mining Company	Centretown
Farmers Mining Company	Hickory Hill

MILLER COUNTY.

Gageville Mining Company	Jefferson City
St. Marys Mining Company	"

CAMDEN COUNTY.

Niangua Mining Company	Jefferson City

WRIGHT COUNTY.

Proprietor or name of mine.	Postoffice.
Clara E. Lane Mining Company	Oklahoma City, Oklahoma
Equitable Mining Company	Newton, Kan.
Red Bird Mine	Mansfield
Beatrice Mining Company	Beatrice, Neb

OZARK MINING COMPANY.

Alice Mining Company	West Plains

HOWELL COUNTY.

Rex Zinc and Lead Company	West Plains
G. & G. Mining Company	"

ST. FRANCOIS COUNTY.

Central Lead Company	Flat River
Columbia Lead Company	"
Desloge Lead Company	Desloge
Doe Run Lead Company	Doe Run
Derby Lead Company	Elvins
Federal Lead Company	Flat River
St. Joseph Lead Company	Bonne Terre
St. Louis Smelting and Refining Company	Flat River

MADISON COUNTY.

American Mining Company	Fredericktown
Catherine Mining Company	"
Mine La Motte Mining Company	Mine La Motte

FRANKLIN COUNTY.

Bartle Lead Company	Union
Belew Mining Company	Lonedell
Daggett Mining Company	"
Great Western Lead and Baryta Company	Morrellton
Rock Island Mining Company	Lonedell
Reed Mining Company	Sullivan
Sango Mining Co	Moselle

WASHINGTON COUNTY.

American Lead and Baryta Company	St Louis
Irondale Lead Company	Irondale
Long, F.	Cadet
Pittsburg Mining Company	Richwood
Renault Lead Company	Palmer
The Washington Lead and Mining Company	St. Louis (611 Wainright Building

JEFFERSON COUNTY.

Valle Mining Company	Valle Mines